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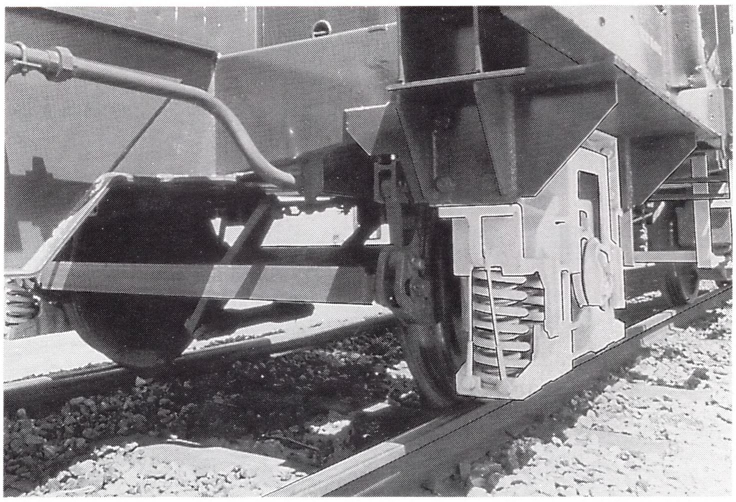
NETWORK

THE RAILWAYS OF AUSTRALIA QUARTERLY

HEAVY haul and rail's future. **GIVING** the Swiss lessons.
ISLINGTON'S revamp. **NEW** age for rail?
MASTERING the 84-wagon coal train.



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THE RAILWAYS OF AUSTRALIA QUARTERLY

THE EXECUTIVE DIRECTOR'S COLUMN

One railway system for Australia? The idea is certainly not a new one. As far back as 1885, Mr W. M. Fehon, later a railway Commissioner in New South Wales, advocated the joint management of the New South Wales, Victorian and South Australian Railways under one board "entirely free from political control." The seed fell on stony ground.

In more recent times, the Federal Government of the mid-1970s offered to acquire the rail systems in each state and to integrate them. From this initiative came the Australian National Railways Commission, comprising the former Commonwealth Railways, the country services of the South Australian Government Railways, and the Tasmanian Government Railways. In the other states, political consideration precluded further amalgamations.

But the move for a unified approach to the major task for rail in Australia – the movement of freight – is gathering momentum. In terms of overall tonnage, most traffic moves within states – coal in Queensland and New South Wales, other minerals in Western Australia, and grain in all states.

On the interstate routes connecting our capital cities, however, there is much room for development and growth. Our major customers are telling us that this growth needs a unified approach and a unified management.

There is community pressure, too, to make better and more efficient use of our steel network; its safety record contrasts markedly with the carnage that is a feature of our interstate highways. No one state has escaped this problem, but a spate of horrific accidents in New South Wales has brought the question into clear focus.

We should all take heart from a recent press statement, issued jointly by the Ministers of Transport in all states and the Commonwealth, that a study of our interstate rail freight network is to begin. The initiative for this move came from within the railway Systems themselves, following a discussion between the railway Chief Executives in 1987.

A small group of high-level railway executives met under their direction and quickly concluded that an achievable and most desirable aim was unified management of intersystem rail freight.

Easier said than done. There are obvious individual interests in the management of this traffic, and these have still to be resolved. The proposed study will look into them.

A new factor has also emerged.

Australia's major producers and shippers in the private sector have long recognised the advantages of rail. Now, they have been invited to take part in the study, with a view to sharing the expenditures that will be necessary to maintain and develop our interstate freight system. As I write this, the spirit of goodwill on both sides of the study team is very apparent.

If this goodwill can be turned into practical action, then Australia's rail Systems and their owners, our governments, have an excellent opportunity to move forward towards the 21st century.

We all hope that it will be grasped.

M.C.G. SCHRADER

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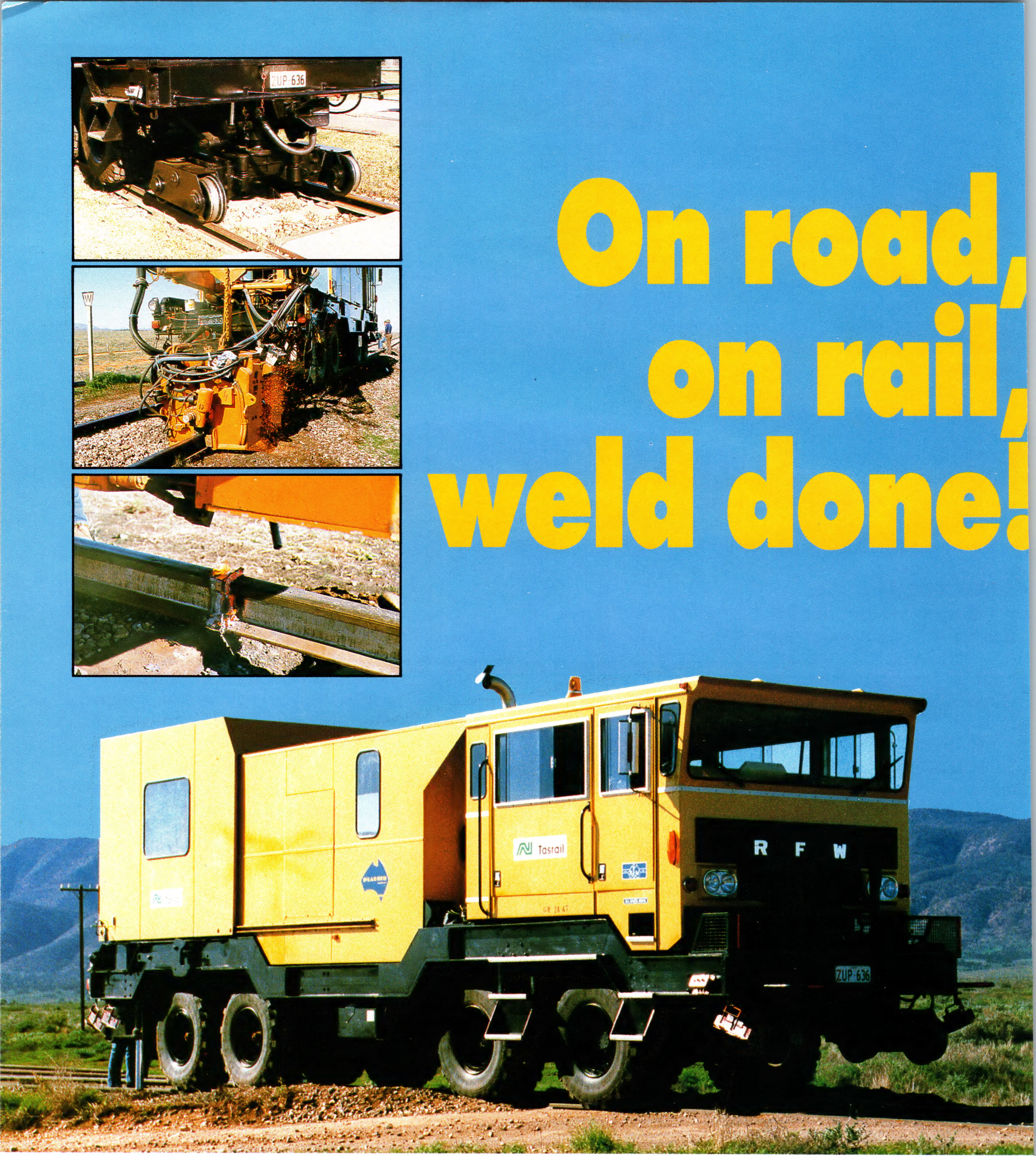

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WINDOWSEAT 52

Front Page: XPT's (Express Passenger Trains) will be a familiar sight in Brisbane and Murwillumbah from mid-February when the faster daily services to and from Sydney commence operation.

How State Rail of NSW took on the heavy haul challenge to double the size of its coal trains.

MASTERING 84 WAGONS

Before 1986, the heaviest train operating in New South Wales was 4,200 tonnes — 42 coal wagons. Pressure on the State Rail Authority of NSW to make its coal haulage rates competitive with other states and overseas producers led to the decision to increase Hunter Valley coal trains to 8,400 tonnes, doubling the length of consists and moving State Rail into the heavy haul category.

The decision was not taken lightly. At the time, the infrastructure could barely cope with forty-two 100-tonne gross mass wagons. Trials began in October 1986 with four 81 Class locomotives of 2240 kW hauling the 84-wagon trains.

The longer consists created immediate problems: level crossings were blocked, passing loops were not long enough, and the range of radio equipment limited communication.

Loading the 84-wagon consist was also difficult for the drivers. Firstly, a constant speed of 0.8km/h was required for long periods. Drivers had to constantly operate the throttle to respond to the signal lights mounted along the

The clip

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THE SPEED CONTROL SYSTEM HAS BEEN HIGHLY SUCCESSFUL AND IS POPULAR WITH BOTH TRAIN CREWS AND LOADING OPERATORS.

loading track and operated by the loading or unloading control centre.

Secondly, drivers had to maintain braking control, placing severe strain on wagon couplings along the entire consist and causing failures.

As supplied, the Clyde 81 Class locomotives had no means of measuring ultra-low speeds such as the 0.8km/h needed at the loaders. This was overcome by the introduction of low-speed digital speedometers, combined with a manual control system, and the fitting of Clyde Speedmaster equipment. (The unit received a commendation in the 1989 Australian Railway Engineering Awards of the Institution of Engineers Australian National Committee on Railway Engineering.)

Before the introduction of these systems, the driver had to change the throttle notches repeatedly in response to signals from the loading or unloading control centre. This system was taxing for both driver and locomotive, often resulting in either overloading or underloading of wagons. It was also bad for the drawn gear, with the train being bunched and stretched repeatedly during loading and unloading.

Low-speed speedometers involved the fitting of a sensitive pulse generator to one of the locomotive axles. The generator puts out 500 pulses per revolution, allowing the speed to be calculated every 10mm of locomotive travel. Measuring range is from 0.1km/h to 9.9km/h, indicated on a LED display on the driver's control console.

Manual power control allows the driver to vary the power of a single locomotive or locomotive consist from zero to the full rated output available in the selected throttle notch. This is achieved by providing the driver with a manual power control rheostat.

While manual power controls the locomotive speed within the required limits, it requires constant adjustment of the power output as the train load changes or as gradients change. Speedmaster was developed to provide automatic speed regulation at a selected level. It simply compares the selected speed level with the measured locomotive speed and adjusts the power output to maintain the speed.

The speed control system has been highly successful and is popular with both train crews and loading operators.

As trains get longer, conventional pneumatic braking systems demand longer stopping distances. Tests show that the initial pneumatic signal travels at about the speed of sound (300m/sec) and takes about six seconds to reach the rear wagon of an 84-wagon train. This signal only applies the brakes at low pressure. To apply the brakes harder, air must be removed from the brake pipe, reducing the pressure from 500 kPa to 330 kPa for full service applications using a fixed choke in the driver's brake valve.

Tests in Australia and overseas of stopping distances on similar types of trains to the SRA's 84-wagon consists showed that the braking performance of the SRA trains was at least equal to similar equipment used elsewhere.

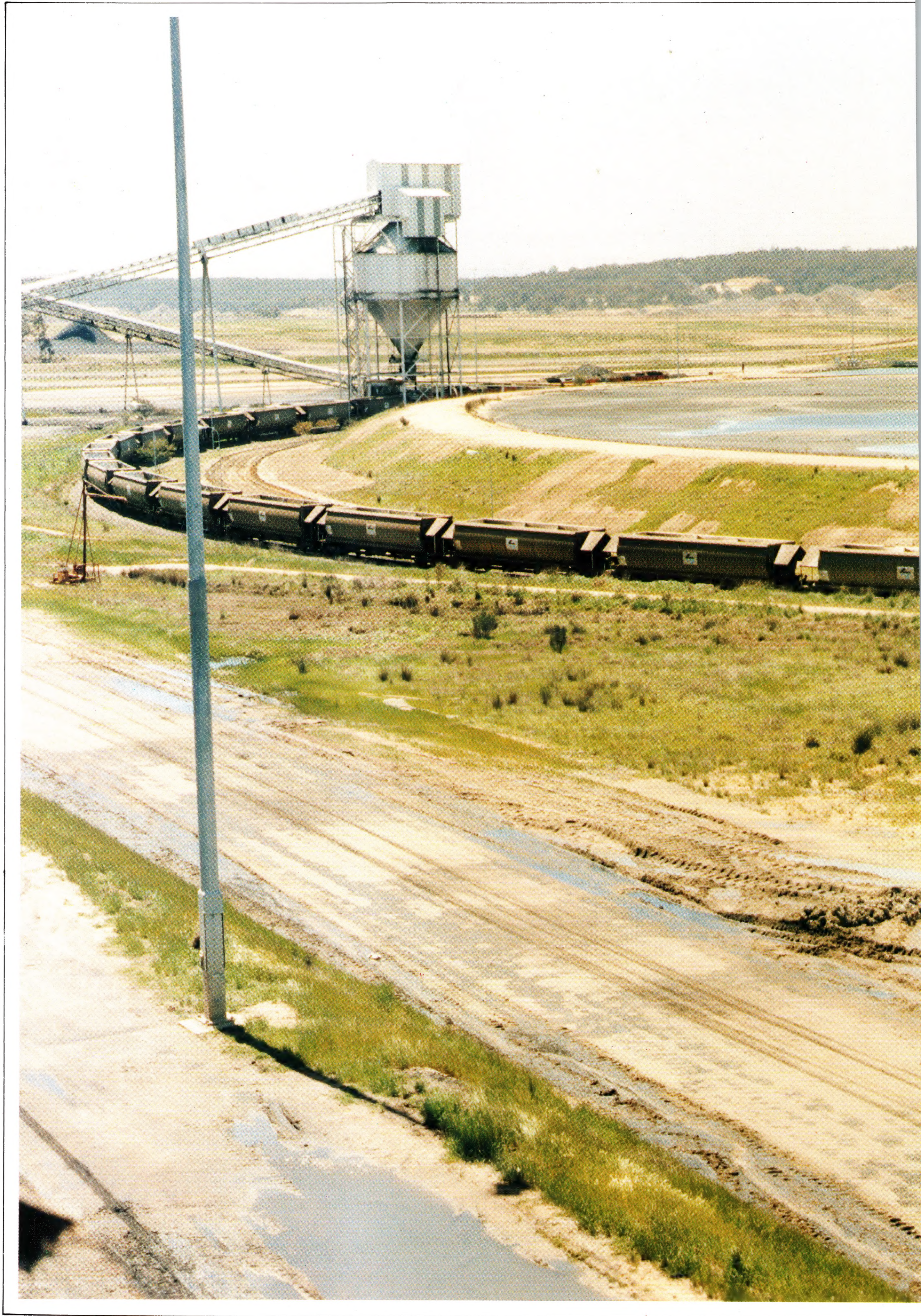
Trials on the 84-wagon trains found that following a service brake application some wagons at the rear of the consist would hunt between the apply and release positions — more a nuisance than a safety problem, usually involving only one or two wagons. In an emergency application, the brakes would apply normally.

Further tests by Westinghouse showed the cause to be the slower reduction of brake pipe pressure in the longer train interacting with the rapid reduction of auxiliary reservoir pressure. This caused an overbalance of forces on the main diaphragm assembly of the triple valve, which made it snap back to the release position. However, the same triple valves operated on long trains elsewhere with no problems.

The answer was found in New South Wales' historically quicker brake cylinder filling times. NSW filling time is about 12 seconds against the ANZR minimum standard of 25 seconds. Brake cylinder fill time chokes were changed, slowing down the pressure drop in the auxiliary cylinder, and the hunting problem disappeared.

Unloading the wagons at the rear of the consist posed problems when the longer trains were introduced. The discharge doors are

Previous page: One of State Rail's first coal trains powered by four Clyde 81 class 2240 kW locomotives pulling a rake of 84 wagons (8,400 tonnes gross weight) at Hexham, NSW.



operated pneumatically, the main air reservoir on the locomotives supplying the air pressure.

Doors on rear wagons suffered from intermittent operation, a malfunction finally traced to low air pressure. This was discovered one bitterly cold winter morning at the loader when it was found that the main reservoir pressure at the rear of the train measured only 250 kPa. In Newcastle the previous night it had been 600 kPa. The cause? Large amounts of water in the main reservoir pipes had frozen solid, restricting the air flow. The colder the weather, the worse the door problem. Unloading was not a problem because the warmer temperatures at sea level meant there was no ice in the pipes to restrict air flow.

The problem was solved by coupling all main reservoir hoses together, fitting improved automatic drain valves on locomotives, and increasing the locomotive compressor governor settings from 710-800 kPa to 750-850 kPa. A master gauge is used to check the settings.

The 81 Class locomotives demand large amounts of air for both combustion and cooling when running at full throttle. Multiple locomotives and single-line tunnels on the Ulan line initially proved to be a bad combination. In the tunnels the second and subsequent locomotives would shut down because the exhaust and air from the lead locomotive was being drawn directly into the air intakes of the trailing locomotives.

This resulted in hot, humid, oxygen-depleted air being supplied to the engine air intakes and the cooling systems for the electrical control equipment and traction motors of the trailing locomotives.

With insufficient oxygen for combustion, the engine would "bog down", reducing oil pressure and bringing on a "low lube" shutdown. In the electrical system, voltage regulators and auxiliary generators were effected and the circuit breakers tripped to protect the system.

Several steps were necessary to beat the problem. Throttle operation was restricted to notch six in single-lane tunnels; the central air system intake was moved down the side of the locomotive and away from the exhaust stack; all locomotives were marshalled with No. 1 end leading; the voltage regulator was designed with higher temperature components; and the voltage regulator assembly was resin coated to exclude moisture. Radiators on all 81 Class locomotives have been refitted with 20psi radiator caps

An SRA coal train loading at the Ulan loop for the 276km run to the port of Newcastle.

This article is based on a paper given by B. J. Jolly and B. G. Sismey, State Rail of NSW engineers, at the fourth International Heavy Haul conference in Brisbane in September 1989.

(previously 7psi) to allow a temperature increase to 125 degrees before a shutdown.

Improved production is a constant goal. How can haulage costs be reduced? The introduction of 8400-tonne trains with four 81 class locomotives takes the SRA to the limits of draw gear and underframe capacity; longer trains using present marshalling patterns are not feasible.

Increases in train size may be achieved if State Rail adopts the Locotrol system where locomotives located mid-way in a long consist are controlled by a radio link from the lead locomotive. This system works successfully in Queensland Railways and Mount Newman in Australia and in several systems in the United States and Canada.

A common train size now in use in State Rail is 6,300 tonnes, powered by three 81 Class locomotives. There are advantages to loading and unloading these consists as separate trains. Combining two of them into a single train of 12,600 tonnes using remote locomotive control systems for the journey from the mines to the sea-board and return makes a great deal of sense.

Potential advantages of this system include reduced brake application and release times, reduced loading through single-line tunnels, improved train control, reduction in the number of train paths needed for given payload, fuel savings, and an increase in versatility without further costly modifications to the infrastructure.

This then is State Rail's vision for the future, a vision that can be quickly turned into reality, bringing cost effectiveness, greater productivity and an assured future for coal exports from the Hunter Valley.

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ELECTRIC SWITCH ON TIME

The conversion of Perth's suburban passenger network from diesel to electric is well under way

A major part of Westrail's conversion of Perth's suburban passenger rail network from diesel to electric, erection of the overhead catenary traction system, is well under way.

Sixty per cent of the support masts and 50 per cent of the electric wire for Westrail's new overhead traction catenary system are now up. The first mast was erected in Rivervale on the southern line to Armadale in January 1989. Since then, masts and wiring have been erected along both the up and down tracks between Perth City and Armadale, and work is in progress between Claisebrook and Midland on the eastern line.

Westrail chose a system of masts and supports that not only looked reasonably attractive but cut costs as well. Based on a New Zealand design adapted to Westrail's needs, the tapered masts are made of pre-stressed concrete.

"We have been very pleased how well the masts have turned out," says Mr Andy Long, Westrail's Manager Power and Overhead.

"We realised that the appearance of the overhead catenary system would affect public acceptance of the electrified railway. For aesthetic reasons, we used tapered concrete masts instead of steel, and concealed the cantilever attachment channel inside the masts.

The overhead traction catenary work is on schedule. It is almost complete to Armadale, south of Perth, on both the up and down tracks. Work will be completed to Midland by March and Fremantle by October

Westrail's decision to install a 25kV AC overhead system was based primarily on cost. The infrastructure is cheaper than for an overhead DC system because the catenary system and masts are lighter for AC and there are fewer and cheaper supply points than for either 600V or 1500V DC. In particular, the 132 kV AC infeed supply from the State Energy Commission is relatively simple.

By choosing what has been accepted as the future Australian standard, Westrail also gained the advantage of a wide choice of the latest technology now available for 25kV AC

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Previous pages: Work on Westrail's overhead traction catenary system for Perth's suburban passenger service. It will be completed to Midland by March and to Fremantle by October.

overhead systems.

But cost and technology were not the only factors. Safety was another important consideration. A DC third-rail system was excluded mainly because there is easy public access to large sections of track in Perth and because of complexities associated with the dual-range railway. The overhead AC system, on the other hand, meets all safety requirements.

Finally, appearance was considered. The lightweight structures used in a 25kV AC overhead system mean that the system can be made more aesthetically pleasing than is possible in an overhead DC system.

To prevent the traction currents in the system from inducing voltages in nearby telephone lines, a booster transformer system was adopted. An overhead return conductor is used, and the return current induced to flow in the return conductor instead of in the rails.

The parallel but opposite currents in the return conductor and the catenary produce magnetic fields that tend to cancel, resulting in a reduction in interference in nearby telephone circuits.

All metallic objects near the rails are to be earthed and connected to the traction rail, which is linked to the overhead return conductor at regular intervals. Calculations by Westrail's consultants showed that the overhead earth wire would not markedly affect the booster transformers' performance.

Other calculations showed that harmonic filters and power-factor correction equipment would not be needed. Westrail are holding the option open, however, until they can test the system.

Perth's overhead traction catenary system was designed by Elrail Consultants of Brisbane. It is similar to the 25kV Brisbane surburban system, which is an Australian version of the British Mk IIIB system. It has a 600A current rating.

The contact wire is 107mm^2 hard-drawn copper suspended from stainless steel droppers hanging from an 85mm^2 stranded hard-drawn copper catenary wire. The catenary has an encumbrance of 900mm and tension lengths that are generally 1700m long. Each tension length has a weighted pulley system that automatically compensates for expansion and contraction (from 0°C to 60°C).

The contact wire has a stagger of 230mm at the masts. Pantograph pressure will be 90+10N over its full range of travel.

Contact wire height is usually 5.25m, but there are exceptions:

☐ At bridges, the height can be reduced. The absolute minimum is 4.21m at Barrack Street in Perth.

☐ Over the dual gauge section of line from North Fremantle to Fremantle the contact height will be 6.20m, allowing the loads of up to 6.00m that are carried on the transcontinental standard-gauge line.

☐ At road level crossings, the contact wire will be at 5.80m, allowing loads up to 5.40m to pass under the electrified wire.

☐ At major highway crossings, the contact wire height will be 6.20m, allowing up to 5.80m under contact wire.

Supporting masts, which vary in height but are generally seven metres, are made of concrete with galvanised tubular steel cantilevers.

The return conductor is a 19/3.25mm^2 stranded aluminium wire, supported on single disc insulators on the back of the masts.

The concrete masts are being cast by Delta Corporation in Herne Hill, Western Australia. Delta produce 60 masts a week. using a linear mould. Most of the castings for the catenary system are being made under contract by Westrail at the Midland workshops.

To erect the masts, an auger is first used to bore holes for the masts. The masts are then brought in by rail, supported in position for concreting and the cantilever arms attached.

During a track possession on a Sunday, the aluminium earth wire and return conductors are run out from the track, followed by the copper catenary and contact wire. Droppers are installed and the whole system checked for height and stagger.

Barclay Mowlem Construction Ltd won the $10 million contract for constructing the overhead catenary system. The company has done similar work for Queensland Railways and for New Zealand Railway's 450km North Island electrification project.

WHY HEAVY HAUL IS THE FUTURE

By William J. Harris

Railroads were all things to all people for a hundred years or more because of the marvellous sets of inventions that led to the creation of a locomotive, then a track structure, and then a train, releasing man for the first time from being himself a beast of burden, or having to train and rely on animals to move his produce.

The enormous flexibility and the capacity for economic development given to mankind as a consequence of the invention of the locomotive, and its rapid dissemination through the developed world, led the railroad industry to become self-satisfied. It was so powerful as a technology, so controlling in the development of the economy, that it lost sight of what was happening in the world around.

The railroad industry was regulated heavily because it was

WE BEGAN TO REALISE THAT RAILROADING OF THE PAST, DEPENDENT ON THE MOVEMENT OF INDIVIDUAL CARS THROUGH THE SYSTEM, NO LONGER SUITED THE CUSTOMER AND NO LONGER SUITED THE OPERATING DEPARTMENTS.

Dr. W. J. Harris was the Institution of Mechanical Engineers eminent speaker at the fourth International Heavy Haul Association conference in Brisbane last year. This is the text of his speech. Dr. Harris is the E. B. Snead Distinguished Professor of Transport Engineering at Texas A & M University and was founding chairman of the IHHA.

capable of affecting the growth or decline of whole sections of the country or whole industries. Those decisions were considered to be too important to be left to the private actions of the railroad industry barons. Politicians and leaders of other industries breathed a great sigh of relief when alternative modes of transportation became available so that they were no longer dependent on the railroad industry.

Alternatives to rail, the highway and the airway, also came about as a consequence of marvellous research efforts. The growth of their use was simply incredible, looked at in any scale of human affairs. The railroads in the United States suddenly found themselves confronted by a competition that forced them to a response for which they were not prepared. Similar competition confronted the railroads in Western Europe and Japan, although somewhat later.

In the United States, we moved very slowly from 20 to 40 to 50 and to 70-ton cars, but very rapidly to 100-ton cars. By 100 ton I mean cars carrying a 100 tons of commodity, and I mean little tons not big tons, but it still ends up with 33 tons per axle when you carry 100 tons of cargo and 63,000 lbs of supporting structure.

We moved to that heavy car at the behest of the marketing departments in the expectation that by so doing we would achieve economies of scale in operation. Savings of 16 per cent were expected. But we forgot about second-order effects. We did not anticipate the effects on track of using 100-ton cars and coupling them into longer trains, and using higher power locomotives. We failed to recognise that these heavy loads might do some very bad things to our system. Indeed, these loads were too great for our tracks. Lateral forces were excessive. In significant parts of the United States serious subgrade problems developed.

As we began research to cope with these matters we had to start from first principles. People like John German took the leadership in our Track Train Dynamics programme to find more effective ways of operating trains as the first step towards bringing the problem under control. People concerned with track structure began to understand how to design and maintain track to withstand the loads introduced by heavy trains. People concerned with the design of equipment finally accepted the requirement for new design standards.

As this was going on, we began to realise that railroading of the past, dependent on the movement of individual cars through the system, no longer suited the customer and no longer suited the operating departments. Beginning in the early 1970s, we came to the establishment of the first unit trains. They themselves created sets of problems that we hadn't anticipated. I recall the disaster in the initial operation of a unit train to bring orange juice from Florida up the east coast of the United States. The fact that we had identical draft gear, and that we didn't understand how to handle that train got us into longitudinal dynamics to an extent that we had very serious derailments, great loss of product, and loss of credibility as effective carriers of this commodity.

After the fact, we learned how to cope with the problem.

We gradually began to recognise that we had to consider in a more fundamental way where the railroads were going. We began to give more and more attention to the interaction between improved designs, improved operating practices, and relevant track maintenance standards. And we have made enormous progress. That progress, and the associated savings and the reduction in government economic regulation, gave the railroads an improved financial outlook. It made possible increased investment by the industry to take advantage of the new technologies and to improve maintenance. New and improved equipment can now be introduced. The industry can continue to advance its capability to operate these systems more effectively.

In the United States, people take it for granted that much of everything we do is heavy haul-related. In fact, heavy haul is so ingrained in railroad transport in the US that those of us who have identified with the International Heavy Haul Association have had some difficulty in making it clear what it is about this association that is new and important.

Elsewhere in the world, similar trends have been changing the way railroads operate. In the USSR, the nature of the economy, the social structure, and the system of central planning have led to great dependence on rail.

There is a highway network in parts of USSR, but vast regions are almost totally dependent on rail. Their reports indicate that 70 per cent of people and goods continue to move by rail. Their railroad structure was heavily influenced by technical decisions made more than 60 years ago. They use 65-car trains with two permanently coupled locomotives. Their infrastructure has sidings designed to accommodate those trains. Their system operations have been dictated by those decisions.

The problems that they encountered were predictable: they gradually found their whole system was operated with six to eight-minute headways between trains. There isn't a track man anywhere who can maintain track under trains operating with six to eight-minute headways.

The Russians began to examine what they should do about this problem. They looked carefully at increasing axle loads, spending three years at their test track at Tcherbinka, just outside Moscow, examining a possible change from 19 to 21 tons per axle. They were very cautious about making that change because the people responsible for their track had a high ranking in the rail system. They were able to make it impossible for the mechanical community to put loads on tracks which were unacceptable to the track engineers. And so, instead of moving to heavy cars as we did in the United States, they began to move to heavy trains.

In the USSR today they are coupling trains together, operating trains of 12 and even 18,000 trailing tons, made up of cars with 20 or 21 tons per axle. The fact that they have coupled these long trains together, and they are operating in a heavy haul mode by the definitions of the International Heavy Haul Association, has given them more spacing between trains and more time for track maintenance. That decision has surely introduced some very serious problems in longitudinal stability. Care must be taken in operations to be sure that these long trains can be accommodated on appropriate sidings, or by splitting the train as necessary to comply with siding or yard track lengths. They can no longer operate in the USSR with the kind of practice that dominated their railroad industry for well over 100 years. The movement of long blocks of cars or unit trains has replaced the previous commitments to the movement of individual cars for all of the technical reasons that I have just cited.

In India, railroads plan to move a large proportion of all their trains with minimum tonnage of 9,000, with many trains of 12 or 18,000 tons, in order to create more dwell time on track for track maintenance, and in order to take advantage of operating economies by operating fewer trains.

China has also faced the need to move towards heavy haul operations. China, like the USSR, does not have a major highway infrastructure. It does move a large amount of traffic on barges in the river system, but the rail network is the only one that connects the great cities of China. That rail network is being called on to move 70 per cent of all the people and goods going between cities. The railway system in China was nearly destroyed by the long period of occupation of China in the 1930s, World War Two, the conflict in China until 1949, and the Cultural Revolution. It was not until about 1978 that the China Railway system could be re-established to serve the economy.

In 1978, railwaymen with experience from the late 1920s and early 1930s in the major operation of railroads came into authority. They quickly brought some 50,000 track kilometres of rail system into service. They had to operate with what they had on hand: steam locomotives, 50-ton cars, automatic couplers, and air brake systems, the last 40 years out of date. They continue to operate with that system, carrying 1.2 thousand million people per year, an average of 240 kilometres per trip. Seventy per cent of all of their goods continue to be transported by rail.

As China began to examine its opportunities for international trade and recognised its vast reserves of coal, it looked to heavy haul experience to move that coal to port efficiently. Some modern high horsepower locomotives were bought and the country is making an increasing number of 4,500 to 5,000 horsepower diesel electric locomotives. In 1989, China discontinued the manufacture of main-line steam locomotives.

A group of us who have had a chance to advise the Chinese over the years have pointed out that they must look at braking systems. You can add enough locomotives to move any train. However, unless you have a modern braking system, you can't stop it. In 1988, a workshop was organized by the International Heavy Haul Association in Beijing to assist the Chinese in their consideration of modern concepts of braking. In China by the time of the Fifth IHHA conference, members will have an opportunity to see a heavy haul main-line coal operation. It is based on high technology. It is based on proper power. It is based on heavy cars. It is based on heavy rail. It is based on good braking systems. It will be a first class participant in

TODAY WE REGARD OURSELVES AS SPECIALISTS. I BELIEVE WE ARE THE CORE GROUP THAT CAN PRESERVE RAIL TRANSPORTATION. WITHOUT THE COMMITMENT TO EFFICIENCY AND EFFECTIVENESS IN THE USE OF STEEL WHEEL AND STEEL RAIL IN HEAVY HAUL OPERATIONS, WE WILL NOT HAVE FULFILLED OUR TRUE MISSION IN ASSURING THE PRESERVATION OF THE RAILROAD INDUSTRY.

the development of technologies relevant to heavy haul activities.

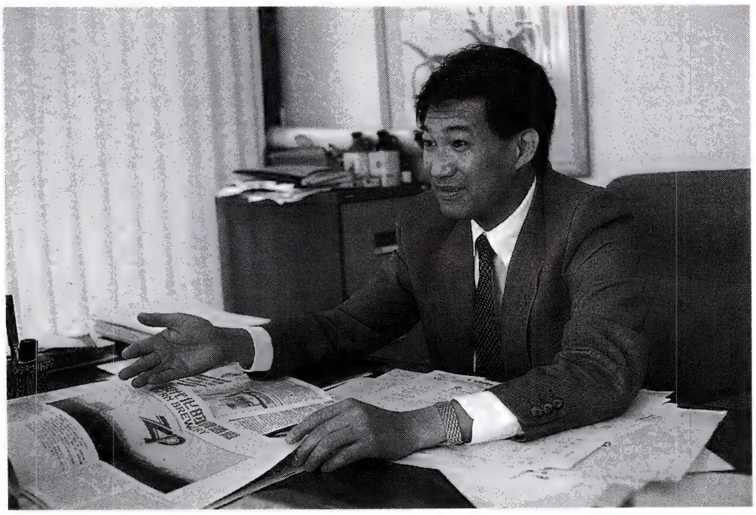
As we look at those heavy haul operations for the transport of bulk commodities, we recognise that the leadership in many aspects resides in the Pilbara, as well as in eastern Australia. In Western Australia, the dedicated lines for moving ore have made it possible to fine-tune the development and maintenance of track, equipment and operation. Those who have to operate mixed freight, as well as dedicated unit trains on main lines, cannot benefit to the same degree from such a fine tuning approach but they can surely learn from it.

In South Africa, over the last 10 or 12 years, they have had major heavy haul operations for the transport of iron ore and coal. South Africa pioneered the development of such things as the steerable truck to reduce rail-wheel friction and wear, and methods of improving the overall operation of the system.

In looking at those developments in technology, we are aware of the importance of sub-grade, rail materials and rail wear, ties and tie fasteners, and ballast. These components must be improved to accommodate either heavy trains of light cars or heavy trains of heavy cars. We have begun to understand more about wheels and what must be done to improve materials and contours in order to address heavy haul problems. Our associates in the International Wheel Set congresses, as well as papers in this and preceding International Heavy Haul Association conferences, have shown us how far technology has moved in a relatively short time to improve safety and efficiency.

In the past, we have regarded the technical issues in heavy haul as representing a set of relatively special problems. However, I submit to you that heavy haul is one of the important waves of the future by which railroads can respond to the competition of other modes. There is the very real possibility that the rail industry can go in only two major directions: towards higher speed service for passenger trains, and towards the adoption of the heavy haul principle for all rail operations. What has been addressed in the conferences of 1978, 1982, 1986 and 1989 by specialists will be the norm for the railroad industry by 1993. Today we regard ourselves as specialists. I believe we are the core group that can preserve rail transportation. Without the commitment to efficiency and effectiveness in the use of the steel wheel and steel rail in heavy haul operations, we will not have fulfilled our true mission in assuring the preservation of the railroad industry.

Heavy haul means many things to many people. It can mean long trains of light cars. It can mean long trains of heavy cars. Let us not lose sight of the fact that in both cases, heavy haul is essential to the future of the railroad industry.



V/LINE MOVES MALT FOR EXPORT

As their incomes rise, the people of many different Asian countries are eating more bread and drinking more beer which, to Australia, means a growing market for grain. The best beer is made from malted barley, and Victoria produces more than 200,000 tonnes of the best malt annually, nearly two-thirds of which is exported. Malting is an age-old process of germinating and drying barley grains, changing the starch into sugar — a process which has now become a highly technical, labour-efficient and profitable business for Stanley Ng at Ballarat.

ASIANS ARE EATING MORE BREAD AND DRINKING MORE BE

He is the managing director of Pacific Maltings, which is now among the top 350 Australian exporters, with the prospect of being in the top 200 in the near future.

V/Line has become part of the company's export drive, carrying around 1,000 containers last year from Ballarat to Melbourne for shipment to brewers in China, Hong Kong, Indonesia, Malaysia, Singapore, South Korea, the Philippines and Vietnam.

"Australia is in the right place to supply countries in the region with raw materials, primary produce and many value-added products," said Stanley.

He has no shortage of ideas for Australian entrepreneurs to capitalise on — their proximity to the Western Pacific region in particular. As a Chinese Malaysian boy growing up in Kuala Lumpur, Stanley wanted to get into the malting and brewing industry.

He went to New Zealand's Otago University for a degree in microbiology with post graduate studies in malting and brewing. After working with the brewers of Steinlarger (now Lion-Nathan), Stanley moved to Ballarat as the chief chemist for the well-known maltsters, Elliott and Magill.

Never one to let his mind grow idle, he took post-graduate studies, and became the Ballarat College of Advanced Education's first malting and brewing course graduate.

Since moving to Ballarat, Stanley had kept his eye on trends in the export market and, having a sure knowledge of the needs of a modern malthouse, which he felt, would give him a comparative international trading advantage, decided to go into business himself.

In 1985 the first stage of Pacific Maltings' new and modern malthouse, with a capacity of 20,000 tonnes a year, was ready for production. This year the second stage, with a similar capacity, was completed.

The productivity and performance of Pacific Maltings in these past few years has been a notable success story for the Victorian Economic Development Corporation (VEDC) which provided financial support.

The malthouse was officially opened by the Premier of Victoria, John Cain, on 20 October.

The Pacific Maltings business, with its small team of specialist staff, has been a boon to Ballarat and impressed everyone believing in Australia's capacity to build bigger export markets in the face of fierce, and often heavily subsidised, competition.

"We are one of the biggest supporters of regional rail services, and the container handling complex at Ballarat Station can put up to 45 containers a week of bagged or bulk malt on rail for export," Stanley said.

"Australia has a good reputation for growing the best, fully ripened two-row barley kernels for grain of the highest quality and yield. Barley growing and malting in this country is very efficient by world standards and this fact, together with a freight advantage, means our malt is more attractive to the Asian brewers."

Pacific Maltings is now supplying an increasing annual tonnage of malt to the makers of such world-renowned beers as Carlsberg in Hong Kong, San Miguel in The Philippines, and Oriental and Chosun in South Korea.

Being Chinese and speaking Mandarin has been a bonus for Stanley, who travels throughout the Asian region four times a year. He takes malt samples, and discusses malt requirements and specifications with buyers.

The Zhujiang Brewery in Canton (Guangzhou Province) is one such customer with whom Stanley has slowly built up a relationship of mutual respect. It is China's first modern brewery, and is based on the quick fermentation process of Artois in Belgium, another famous name in European lagers.

In China the Zhujiang brand Supra lager and the Huaxing lager are highly acclaimed and relatively inexpensive. Stanley believes that there is enormous potential for more malt exports as per capita consumption increases and more people choose beer rather than Maotai, or rice wine, and other hard liquor.

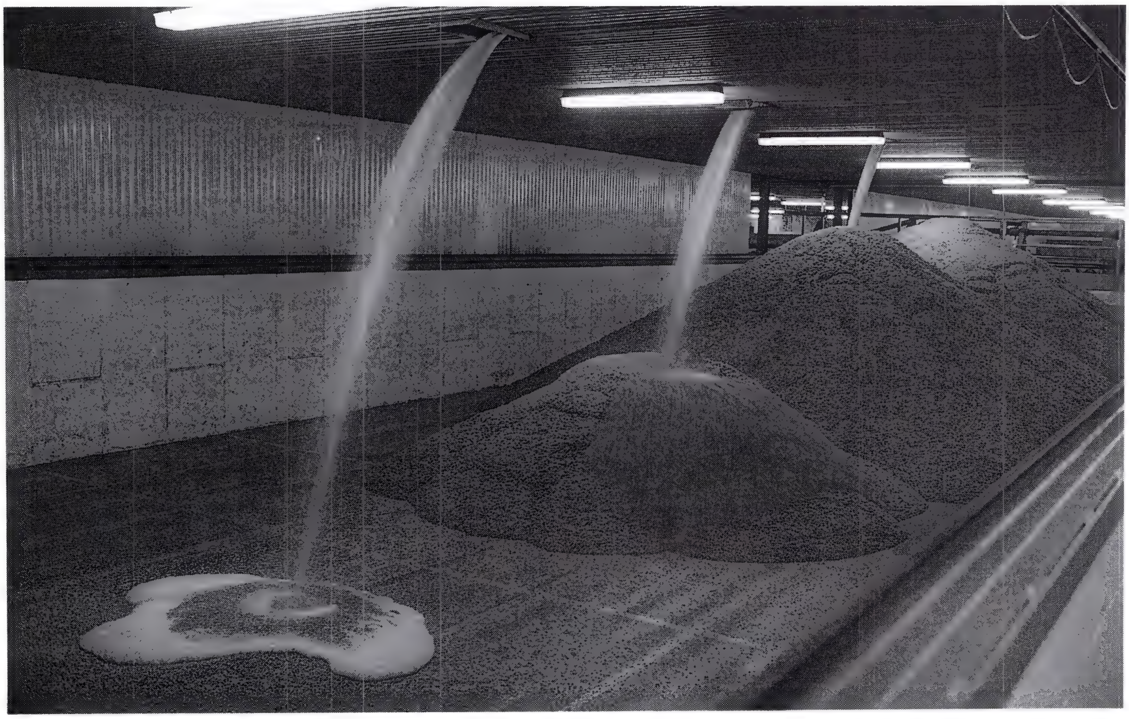
Apart from increasing sales to countries like Indonesia, Thailand, Taiwan and Vietnam with their well-established brewing industries, Stanley hopes to supply malt to Burma and Cambodia in the not too distant future when they, inevitably, begin brewing their own beers instead of importing.

"Australians have a good trading name in Asia," he said, "not a reputation for being aggressive sellers or quick profiteers. The malting business takes time to build up, and every customer has different malting quality requirements, depending on the end use.

"They specify the range and limits for such factors as levels of extractable sugars,

Previous page: Stanley Ng, building Australian exports to Asia.

D PROVIDING A GROWING MARKET FOR AUSTRALIAN EXPORTERS.



Malting involves a delicate grain germination process.

protein, enzyme activity, soluble nitrogen, moisture content and fermentability.

"Consequently, malting has to be precisely controlled at each stage of production to make malt of perfect quality and consistency.

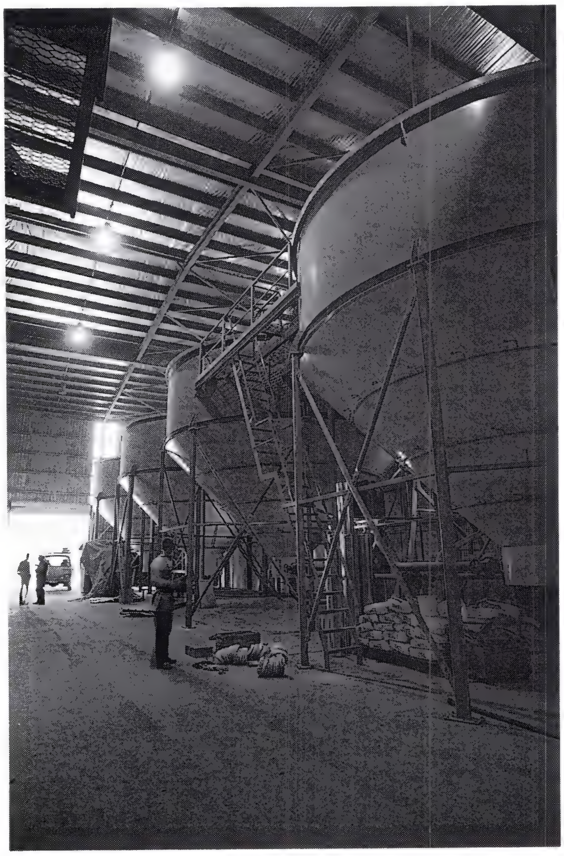
"We have to accurately test grower samples before buying their barley and we continually monitor and test the malt in the process of breaking the starch into soluble carbohydrate through the germination and drying stages."

It takes about 1.25 tonnes of barley to produce a tonne of malt. There is not much room for wastage or inefficiency in the modern malthouse. Malting is now a finely tuned, computerised and almost fully automated process of treating large tonnages in a continuing sequence — from receival of barley to despatch of the malt to the rail terminal.

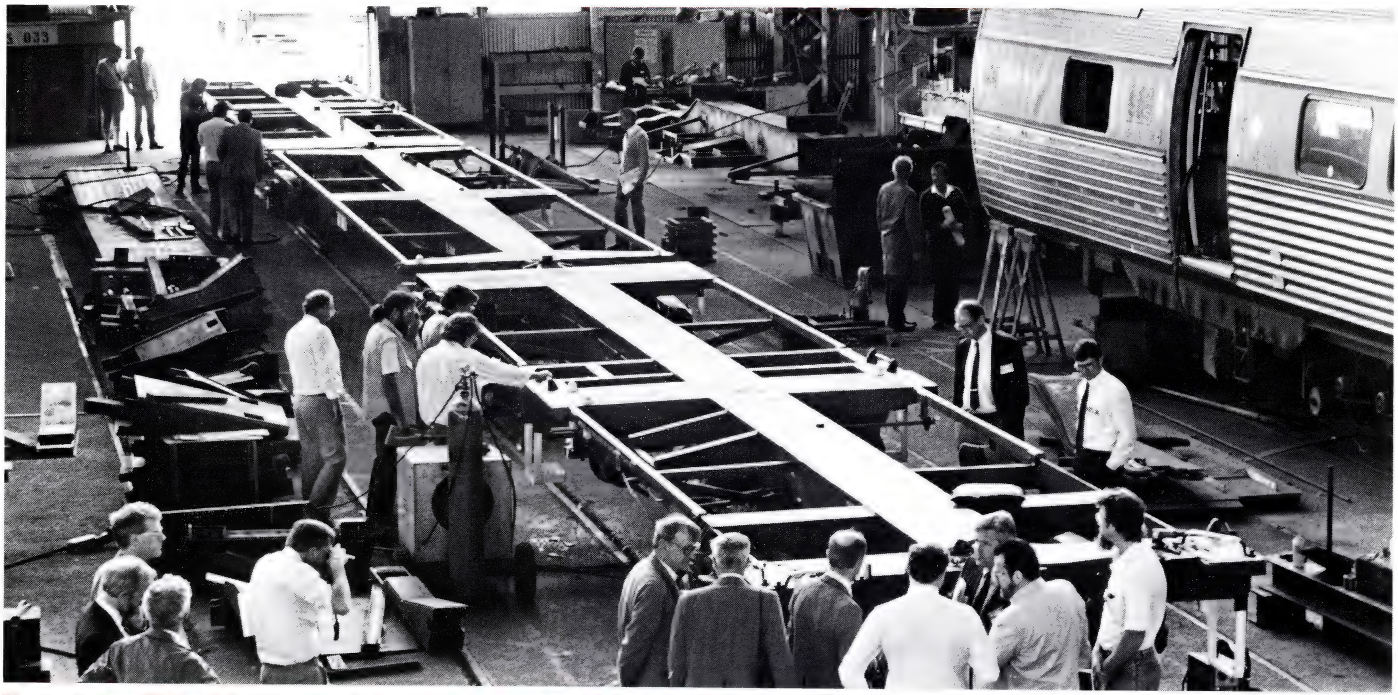
Stanley Ng would like to move into the manufacture of other malt products, but that is something that can wait.

He has the air of patient progress, getting things done in plenty of time.

"There is an old Chinese proverb," he says: "the stronger a person is, the more humble he has to be. Like a stalk of barley, as it becomes heavier with ripening grain, the more it bends."



Pacific Maltings has Australia's most modern malthouse.



The prototype V/Line 3-Pack wagon is inspected at the Ballarat workshops.

3-PACKS COMING UP

V/Line is banking on efficiency gains and maintenance savings in interstate container freight transport when its new 3-Pack articulated container wagons come into service.

V/Line's Project Manager for the 3-Pack wagons, Gerry de Bont, says the system has borrowed the basics of the Australian National 5-Pack wagon and extensively modified them to suit V/Line's needs.

Five prototypes of the 3-Pack wagon, designed to operate at the 115km/h speed of the Superfreighters, including one with a "well" centre platform, are being manufactured at the Ballarat workshops.

The centre platform of the "well" wagon will be sunken so that high containers can be carried.

"The 3-Packs will carry any possible combination between three 12.2 metre containers or six of the 6.1 metre containers with a maximum total payload of 126 tonnes," says Gerry de Bont.

"The wagons consist of three platforms over four bogies, which represents a considerable saving in capital and maintenance costs, as well as offering a range of other operating advantages over a normal wagon with the same number of containers.

"Because the 3-Pack is articulated, it is less of a capital cost – simply because there are fewer wheels and bogies and it can carry more per metre-length of the train."

Ballarat workshops will produce the first order for 20 3-Pack wagons.

David Ferris, Manager of Vehicles Engineering Design, says the wagons are much more stable because constant contact side-bearers, which control the "roll" of the wagon, are used.

"The end of the platform is also extended to allow for extra flexibility in loading, and the loading is more evenly distributed over the axles, which brings significant operational benefits," he says.

"The very latest technology, new to Australia, is also being used for the wheels. It means that stress is lessened in the wheels and the possibility of broken wheels is minimised," David Ferris says.

"With articulated wagons there's less slack and therefore less wear than is generally the case with the normal coupling of wagons.

"This, and the more consistent braking efforts of the 3-Pack, should make an articulated container wagon train a much easier beast to handle."

A higher than usual grade steel is used in the 3-Packs, which means the wagons are more durable. The bogies are Roadmaster high performance low-level types made in Australia.

Gloucester bogies on loan from the State Rail Authority of NSW are being tried with one of the 3-Pack prototypes.

Gerry de Bont says the 3-Pack use automatically variable load compensation for the braking equipment. This means that braking is automatically applied at the optimum level for the load being carried.

"Normally, a compromise between a low-braking effort for empty wagons and a high-braking effort for full loads is used.

"The automatically variable system for braking is used on freight trains in Europe, and we are the first to use it on freight trains in Australia.

"With the growing concerns about human and product safety in road transport, these new developments in articulated container wagons are important to all of us."

Gerry de Bont and his team worked closely with Australian National to launch the project.

AUSTRALIAN HIGH TECHNOLOGY IS GIVING THE

SWISS LESSONS

FILMING 400km OF SWISS RAIL TRACK WAS AN IDE

Previous page: A Swiss Federal Railways (SBB) Re 4/4 locomotive on a freight run at Amsteg Silenen.

A West Australian company, ACET (Applied Computer and Engineering Technology), has broken into the highly competitive European market with an order for a locomotive driving simulator from the Swiss Federal Railways (SBB).

Australia's first ACET driving simulator was installed by Hamersley Iron Ore Railways and three years ago ACET simulators were introduced by Queensland Railways at Callemondah and Jilalan (near Mackay). V/Line's new ACET simulator will be in use early this year.

John Phillips, V/Line's video officer, spent some time in Switzerland in late 1989 shooting video footage of 400km of track on the Swiss system. It was an ideal warm-up, he says, for the 3,000km of track footage needed for the V/Line ACET simulator's software. Filming of V/Line track in Victoria began in November last year.

John Phillips' experience in Switzerland on a V/Line contract enabled him to see Swiss railways the way trainees will see them on the simulator screen — from the driver's cab.

Specialised video equipment including a Sony M7-3 CCD video camera, a Sony Betacam 35P recorder and other Sony equipment were bought by V/Line to film Swiss track footage for the Swiss simulator.

This equipment was set up in the driver's cab of an SBB electric multiple unit. The camera was mounted beside the driver and the video image checked on a portable monitor. The ACET equipment was in the luggage compartment and included a "Locologger," monitor, portable computer, a transfer unit, and synchronising switches.

The "Locologger" was coupled to the locomotive's speedometer drive. During filming the test train was required to travel at a constant 75km/h. When the tape ran out or the test train was stopped at a red signal, the train had to back up and then accelerate to filming speed so that an image of the entire track at a constant speed was maintained.

John Phillips was impressed by the efficient operation of the Swiss railway system.

"The speed and smooth operation of the Swiss trains were most impressive. Their track is absolutely beautiful," he says.

Most impressive was the Gotthard route through the Alps to the Italian border.

"The line features three spiral tunnels and then a 14km tunnel right under the Alps — a magic piece of railroad, and a magnificent feat of engineering."

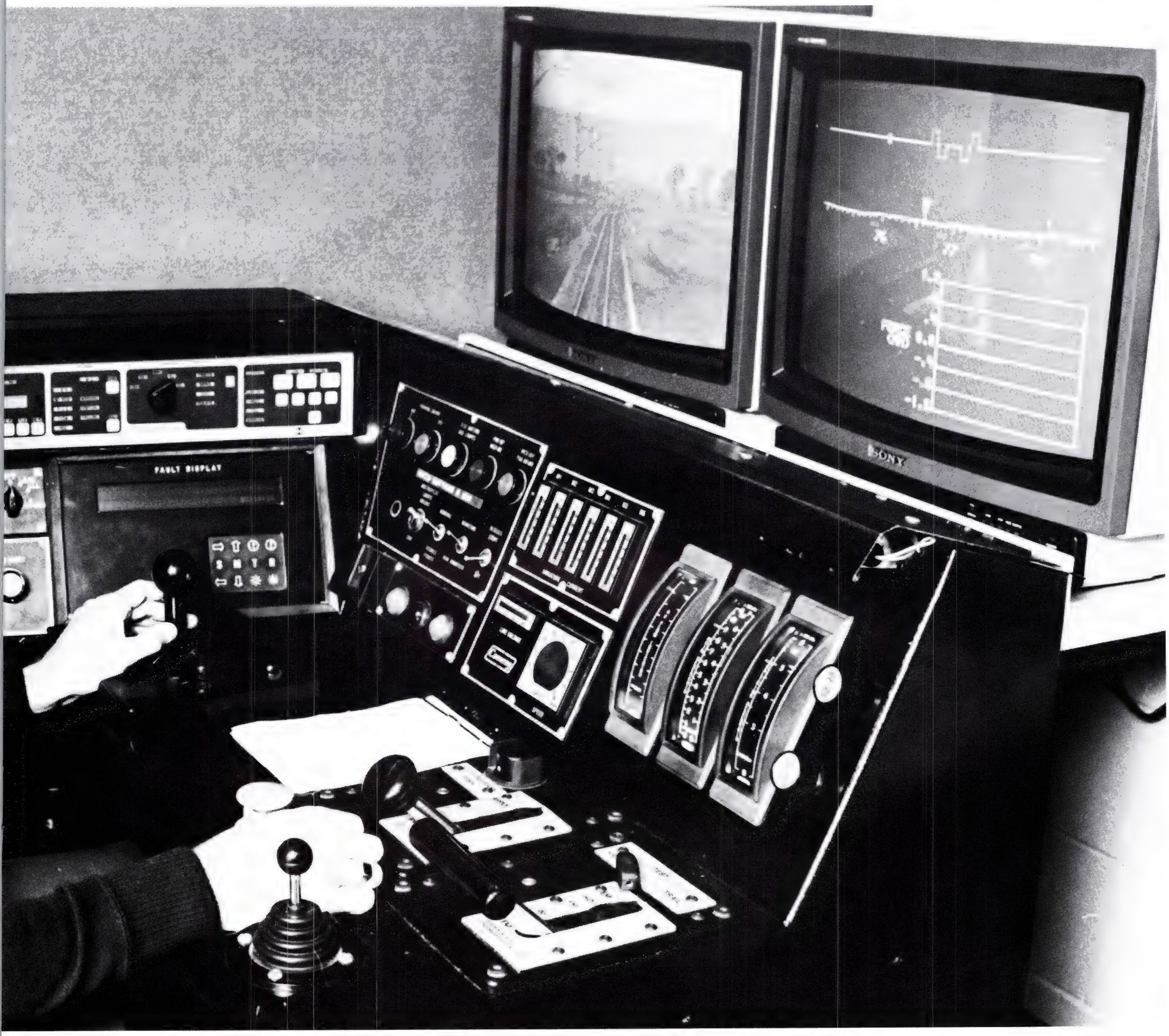
John Phillips was based in Bern for two

weeks and completed his assignment on schedule before returning to Melbourne to start videotaping the Victorian system.

Frank Wagner, V/Line's Priority Projects Group Manager, says a completely new training program will be developed around the new ACET simulator. Although the software design has been based on V/Line operations, the course can be adjusted to suit any passenger or freight operations, including training for heavy haul crews.

The V/Line project was developed with the co-operation of V/Line's enginemen and their

RM -UP FOR SHOOTING 3,000km FOR V/LINE'S LOCO SIMULATOR



union exective, Colin Oates, the project manager, joined V/Line after serving in the RAAF, where he was involved in the design of programs for the FA 18 Hornet simulator.

In the V/Line program, trainees will go through an introductory course, followed by a second stage covering railway practices. The final stage is theoretical and practical instruction. The ACET simulator develops skills in controlling train dynamics and enables the trainee to handle any track or corridor.

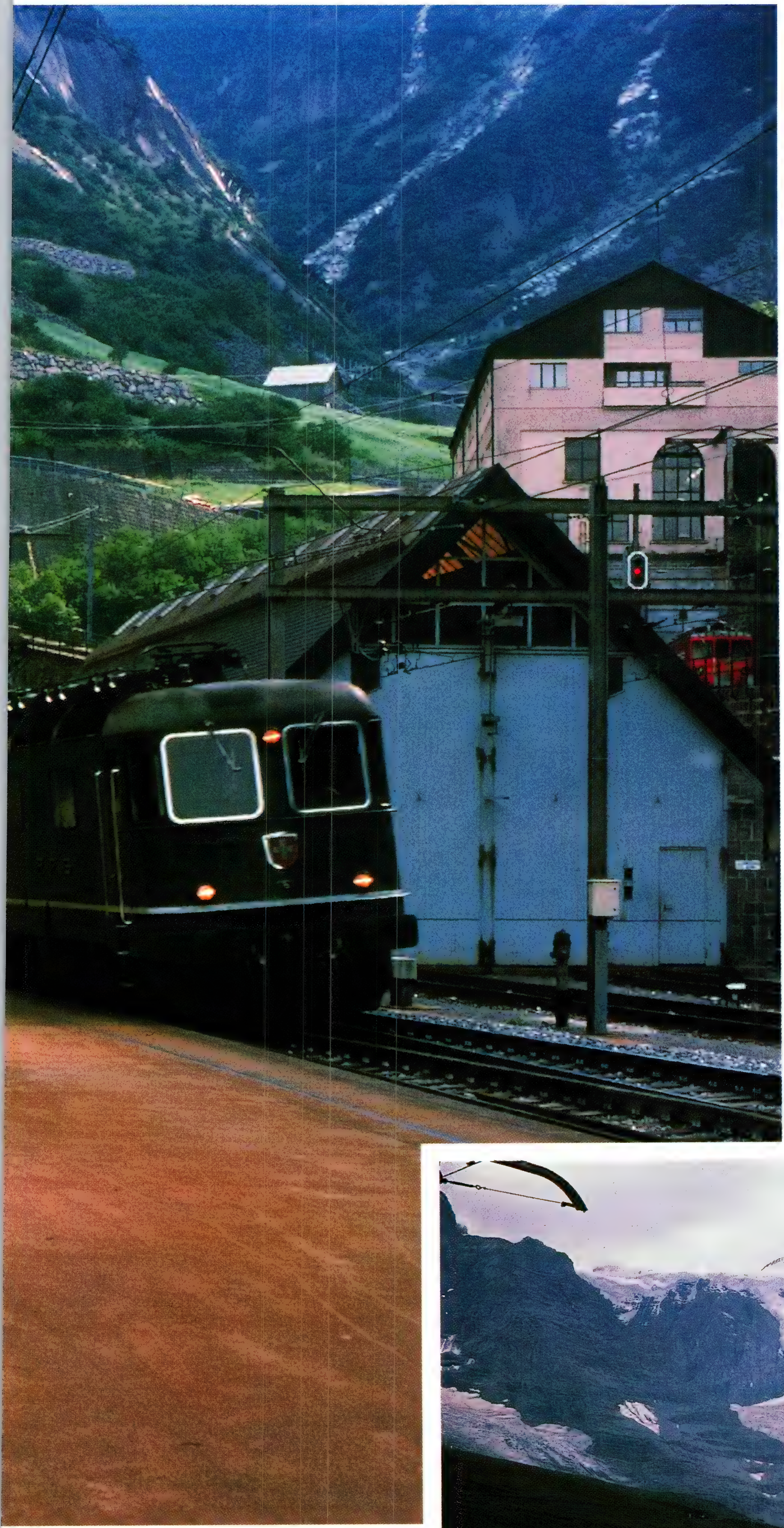
Full-scale operation of the V/Line training program is expected this year.

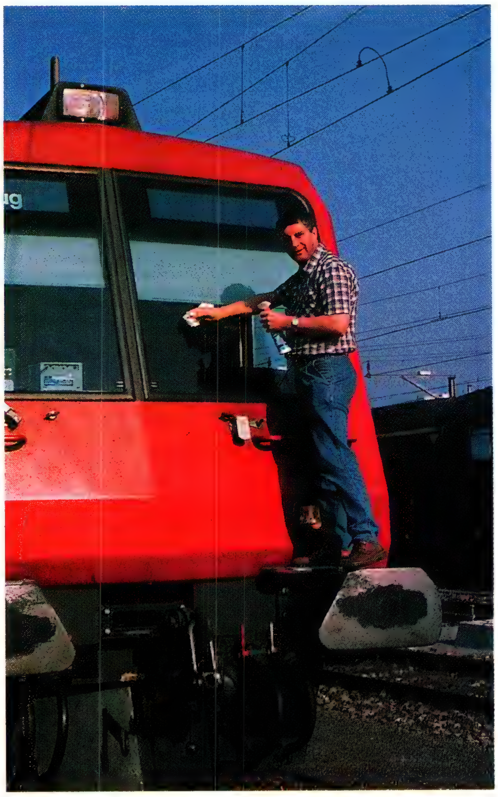
Railways of Australia is also using ACET's longitudinal dynamics expertise — the "heart" of the simulator. According to Michael O'Rourke, ROA's Engineering Research Manager, ACET is the international leader in longitudinal unit train dynamics technology.

"They have provided proven products based on extensive testing in Australia's Pilbara. ACET is now training ROA Systems engineers to use complex computer simulation programs to evaluate design features involving train length, longitudinal impacts in vehicle design and computer selection."

Queensland Railways ACET loco training simulator at Callemondah, near Gladstone.

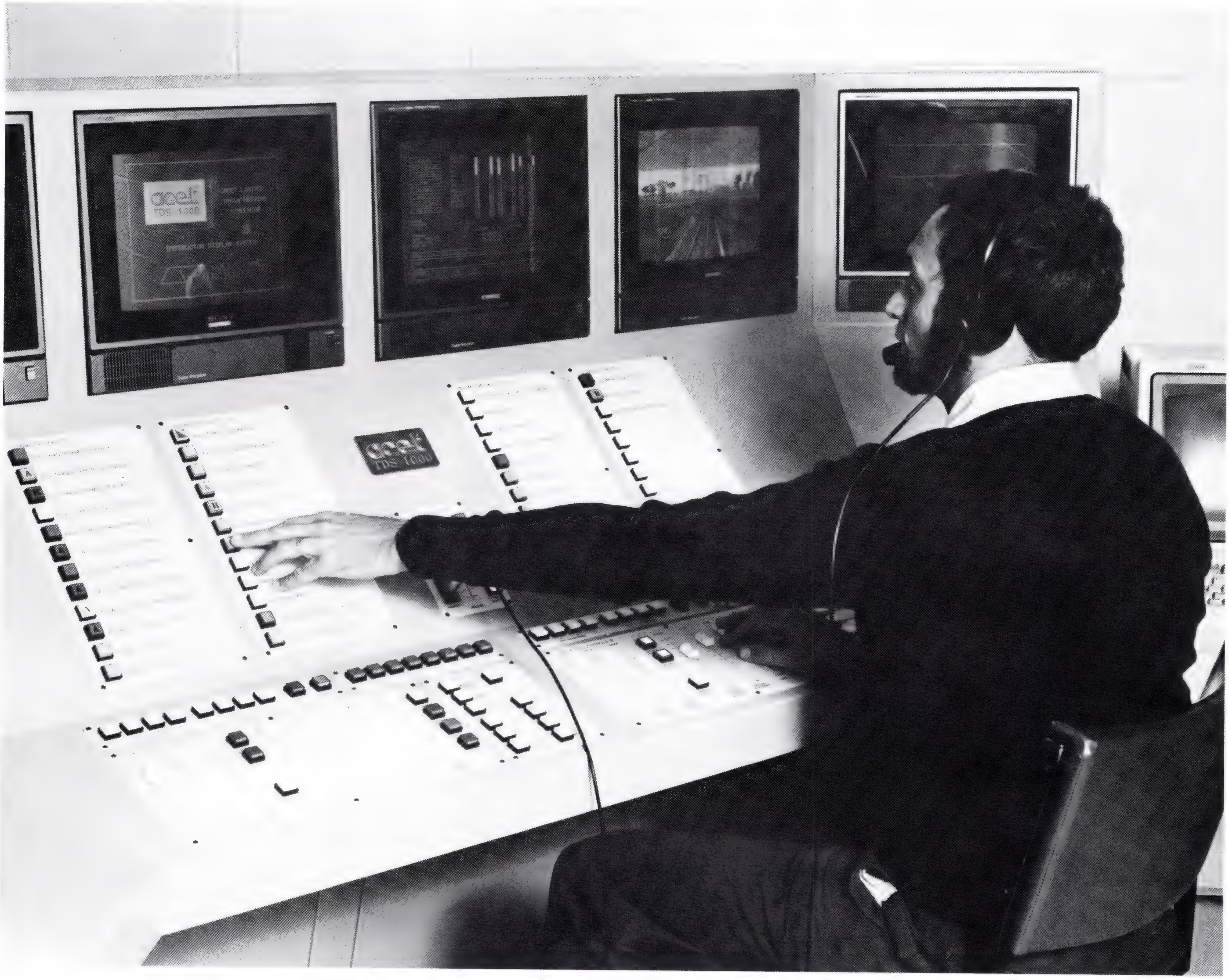
Swiss Federal Railways Re 4/4 loco hauls its passenger train out of the 14km Gottard Tunnel into Goschengen Station.





John Phillips of V/Line cleans the windows of the test train at Zurich freight yard before a filming run.

Below: Two rack trains of the Jungfraubahn climb towards the Jungfrau from Kleine Scheideg.



THE ELECTRONIC LOCO

Supervisor's control panel for the ACET simulator at Callemondah, Queensland. Queensland Railways has another simulator at Jilalan, near Mackay. V/Line's first simulator goes into use early this year.

The Swiss Federal Railways (SBB) simulator is based on equipment from an Re 4/4 electric locomotive, one of the main workhorses of the SBB system. A driver's desk, two electrical panels and one pneumatic panel from a locomotive are used in the simulator.

On the driver's desk the brake valves, the handbrake and the brake gauges are modified so that they can be read by or controlled by the simulation computer through a microprocessor controlled input/output system. Existing electrical devices, such as ammeters, can be connected to the microprocessor system without modification.

The electrical panels contain relays, fuses, circuit-breakers and isolating switches. In the simulator these devices retain the exact appearance they have on the locomotive but some require alteration so that they can interact with the simulator.

The pneumatic panel on the locomotive brings together most of the critical pneumatic devices, such as, pressure regulators, gauges and isolating valves for brakes, the pantograph, and the pneumatically powered main switch. Isolating valves required in the simulation have been fitted with electrical switches.

The instructor is provided with a desk with a control panel and a number of video and graphics displays. From the desk he is able to configure, start up and control the progress of the simulator, while a student driver goes through a number of exercises. They can include preparation of the locomotive for duty, an Intercity passenger express train run with tight timetable, a local passenger train with stops at every station or a freight working.

The driver on the simulator gets a forward view of the track on a large colour monitor. Speed of track replay is controlled by the simulation computer to match the speed and location of the locomotive on the track. The instructor has a smaller monitor showing the same scene.

Noises recorded on a locomotive at speed and stationary in a yard, have been analysed and used to synthesize audio effects on the simulator. This enables sounds such as track AWS alarms, "deadman's" warnings, compressor operation, ventilation fan whine and track clatter to be experienced by the driver on the simulator. Each sound is synchronised with cue, whether from track, driver action or locomotive operation.

A special feature of the SBB simulator is the display showing the driver the speed profile at which he should drive to arrive at the next station on time and with the most economy.

The simulator will be used at two exhibitions in Switzerland early this year before assisting with the training of new drivers.

AN freight train is unloaded in intermodal yard at the Islington Freight Centre just after sunrise.

ISLINGTON TO SET NEW STANDARDS FOR FREIGHT

Australian National has begun a major five-year expansion program costing $19.5m at Islington Freight Centre to upgrade and expand facilities to cope with future traffic loads and to improve efficiency and customer service.

The Islington Freight Centre, which is in the heart of the northern industrial area near Adelaide and Port Adelaide, is Australia's first fully integrated road/rail centre and operates seven days a week.

The most modern of its type in Australia, the centre has the latest railway technology. It has been commended by the National Institute of Materials Handling for outstanding achievement and innovation in transport materials handling.

Islington was commissioned in December 1982 but within a few years had become too small to handle the growth in traffic. A separate intermodal yard opened in December 1985 to cope with the increase in containers.

The intermodal yard has two 1.2km loading and unloading roads with an 800-metre paved area for all-weather working. The heavy load and rapid lift area has a heavy duty ramp for easy loading of heavy and indivisible loads.

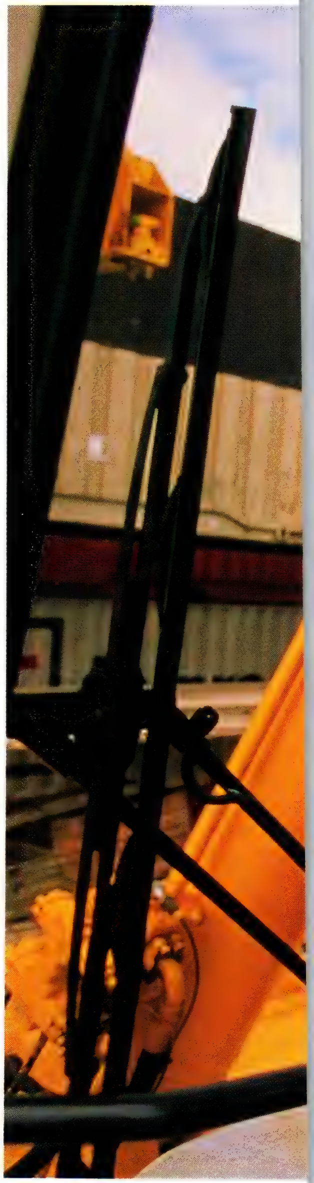
Two loading ramps in the motor vehicle handling area provide for both end ramp loading and transfer directly from the raised platform on to flat wagons.

Two roads are serviced by a gantry crane with a lifting capacity of 32 tonnes that is used for containers, pipes and other items. The crane is backed up by a forklift whose mobility ensures quick loadings.

There are four mobile piggybackers with lifting capacities of 40 tonnes. The telescopic spreaders can be extended from 6.1 metres to 12.2 metres and can carry containers end-on, square-on or at an angle. Piggybackers can handle both top and bottom lift containers or freight pans. A team of fitters is always on site to fix any problems or piggybacker breakdowns.

Islington's volume of traffic has continued to grow. In 1985, one shift and one forklift could handle the whole gantry area. By October

Left: An AN security guard at the Islington Freight Centre checks a consignment of new cars before loading. Behind him is a triple-deck car carrier.



Right: AN Islington piggypacker operator carefully positions a container on a wagon.

Far right, bottom: A clerk uses the CRIS computer system at Islington to find the whereabouts of a container.

Right, bottom: Trucks queuing at the entrance to the centre. The redevelopment plan will eliminate congestion by providing a new entrance to the intermodal yard.

Left: Double-stacked containers on an articulated wagon.

FORD
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1989, two shifts and four piggybackers were needed to lift more than 4,000 containers a week. The increase in consignments has grown by 60 per cent in one year. More than 2,400 rail wagons are now being handled each week.

Islington staff are also handling 150 new cars a day, 400 piggybacks a week and 60,000 tonnes of steel a year for BHP.

Apart from the increase in container traffic and the consolidation of freight activities with the transfer of broad-gauge container handling from Mile End to the Islington centre, several other developments have strained the centre's resources:

☐ The transfer of freight between trains that used to go through the bogie exchange as a result of market demands for quicker transit times.

☐ The specialised requirements for traffic such as refrigerated goods or for heavy mining machinery.

☐ Introduction of the 5-Pack service.

☐ Introduction of longer trains, particularly the Melbourne Superfreighter.

Improvements to the terminal have helped keep up with the increasing demand for services. A roller-compacted steel pavement area built for handling and storing steel has dramatically improved throughput. The container reservation and inventory system (CRIS), developed by State Rail of NSW, has reduced waiting times, speeded up throughput and allowed accurate container tracking.

CRIS records container type and number, consignor and consignee details, origin and destination details, despatch, delivery and pick-up details, and wagon number, container mass, and carrier details.

An additional one-kilometre track built next to the shunt main allows assembly of long trains without obstructing other shunting activities.

The freight information rating and shipment tracking system (FIRST), developed by AN, is being progressively introduced and will make possible the paperless consignment note. Customers will eventually be able to key in consignment details directly to AN's computer network and will also have direct access to tracking information.

The five-year $19.5 milion Islington redevelopment will cater for the predicted growth in traffic over the next five years and allow for extensions and development.

The plan has four main features:

☐ Improved customer facilities, particularly a new direct entrance to the intermodal yard.

☐ Improved track layout and intermodal yard paving to handle increased loading and unloading tracks of greater length.

☐ Introduction of new handling equipment. Straddle cranes will be the basic handling machinery of the future, with support from piggybackers.

☐ Modernised and expanded communication and security systems.

The benefits from the development will be new traffic in containers, less shunting and fewer wasted lifts.

The first stage of the redevelopment provides for a new electronically-controlled weighbridge, a new entrance and three entry lanes for processing incoming vehicles, a new control tower, streamlined traffic flow through the terminal to cut the time a vehicle spends inside the centre to half an hour, and improved communications and security.

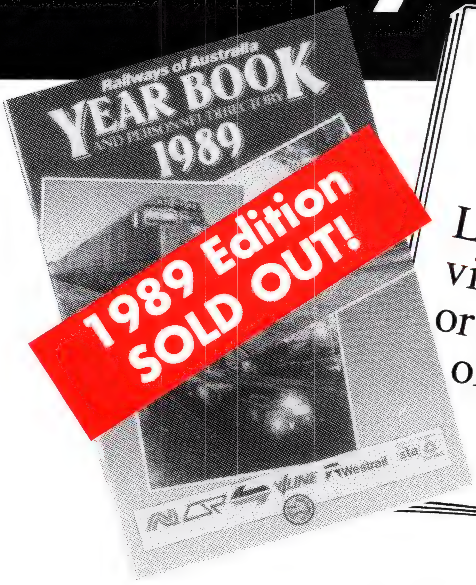
Customers want easy access, easy unloading and collection of containers, and a quick turnaround. This means drivers need quick and precise directions to the loading and unloading point and a minimum of paperwork. When the incoming vehicle has been weighed, the operator will record details such as the consignment note, load, destination, and the vehicle registration number. The driver will then go to a gate for a printout of the consignment sticker and on to the slot allocated in the yard or on a train. The slinger will collect the note and unload the container.

These developments, plus two new 1.2km tracks and adjacent paving for the Superfreighter and 5-Pack services, should be in service by March this year. The new paving area will provide some storage space for containers and piggybacks and a safer area for operating the piggybackers and for customers' trucks.

A southern rail access should be finished by March 1990. It will allow direct broad gauge access into the intermodal yard, eliminating shunting or splitting. Train examination can begin as soon as the train stops. There will be time savings for customers as well as AN and the time between loading cut-off and train departure will also be reduced for trains to Melbourne.

Security at the terminal has already been improved to provide increased protection for customers' freight. This includes a two-metre fence and a microwave burglar intrusion alarm system around the perimeter, a security command station at Islington coordinating 24-hour security, regular patrols out of working hours, and surveillance at the centre.

The facts about Australia's Railways revealed...



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Westward-bound 3801
Bicentennial steam train near
Molong, NSW.

THE ROA BICENTENNIAL STEAM TRAIN'S SUCCESSFUL YEAR BRINGS A BONUS FOR LOCO 3801

A STEAM DIVIDEND

The Railways of Australia Committee's Bicentennial steam train to all Australian mainland capital cities steamed almost 13,000km on its major journeys and many thousands more on special day trips from the capital cities.

The train was hauled by 3801, delivered to the NSW Department of Railways in 1943. It was the first of a class of heavy express steam locomotives that was to become famous in NSW and throughout Australia and is considered by many as the ultimate expression of Australian steam locomotive design.

After withdrawal from regular service, 3801 was rescued by enthusiasts belonging to the NSW Rail Transport Museum, who raised enough money to overhaul the locomotive.

In 1970, 3801 achieved her greatest triumph when she took an enthusiast special, the Western Endeavour, to Perth and back, becoming the first locomotive to cross the entire continent under steam.

Serious boiler problems eventually ended her operations, and 3801 became an exhibit at Thirlmere Museum.

In 1983, the State Rail Authority of NSW agreed to look at the feasibility of restoring 3801 to steam. The first cost estimates were prohibitive. Then a solution was found by the Department of Labour and Industry: it offered to provide the labour under a training scheme for out-of-work apprentices, the Hunter Valley Training Company. The locomotive was taken to Newcastle, where about 800 apprentices gained work experience over the next three years on all aspects of the restoration.

The Executive Director of Railways of Australia, Mr Michael Schrader, presents a cheque to Professor John Glastonbury, chairman of 3801 Ltd.

In 1985, a non-profit company, 3801 Limited, was formed to raise funds from industry to pay for the materials and restoration of a train of period carriages to accompany the engine. About $500,000 was raised in cash and kind, and a Bicentennial grant assisted with the carriage repair. This money will go only part way toward offsetting the full cost of the operation, and 3801 Ltd will continue to run tours to keep up the cash flow needed.

During 1988, 3801 repeated her east-west performance by running across the Nullarbor Plain to Perth.

Costs of operating the ROA Bicentennial Train were covered by sales of tickets – and, happily, there was a surplus.

At a meeting in 1989, the Railways of Australia Committee, the Chief Executives of the five state railways, agreed that part of the surplus should be passed on to 3801 Limited. After all the accounts were paid and all the sums done, $45,000 was available.

A cheque for this amount was recently handed over to the Chairman of the company, Professor John Glastonbury, by Michael Schrader, the Executive Director of Railways of Australia.

THE SUPERF REVO

SUPERFREIGHTERS, the overnight container trains between capital cities, have revolutionised Australian container carriage and reinstated rail as a force in freight forwarding.

In the five years since Superfreighters began running between Sydney and Melbourne, Adrian Ponton has seen a national service grow. Adrian, a former marketing officer for Superfreighter, has been appointed Senior Operations Manager of the Dynon Terminals. He is part of a new five-member team managing V/Line's fast-growing container shipping business.

"Superfreighter has revolutionised container movement in Australia," he says. Part of the revolution has been in changes to traditional methods of railway operation.

"Previously we would get loaded wagons from a number of small sidings and put them together as a train-load. There would invariably be delays, and our customers steadily opted for other carriers, which usually meant they went to road.

"With Superfreighter, our customers know the trains will run every night they are scheduled. If they need space, they simply ring us, and then rest assured that their containers will arrive at their interstate destinations the following morning," he says.

Wagons on Superfreighter trains have much faster turnaround times, and spend more of their time actually carrying freight, than wagons in ordinary freight traffic. This is because Superfreighter trains remain integral (the wagons are permanently coupled) and run from terminal to terminal.

The container flat wagons on the Adelaide Superfreighter, for example, make three return trips a week, while similar wagons in general shipping traffic take about 10 days to turn around.

> Rail is coming t
> oldest problem i
> of freight quickly

There are Superfreighter services between Melbourne and Sydney, Brisbane, and Adelaide. A similar service called Westliner runs from Adelaide to Perth. Two trains go to Adelaide on week nights and one on Saturdays. They connect with Westliner daily except Wednesdays.

Not only the frequency of service has increased. The purchase of more powerful locomotives has made bigger trains and greater reliability possible — both important in providing a guaranteed service.

EIGHTER UTION

There have been several changes on the Sydney corridor where it all began.

"Superfreighter started as a service solely for RACE or railway-owned containers in October 1983," says Adrian. "In mid-1984 the equivalent capacity for standard 20-foot containers (TEU) increased from 40 to 60 and the restriction on RACE containers was lifted."

ore in providing answers to the tralia: how to move large quantities economically across vast distances.

This meant that any container meeting industry standards could now be accepted. Size and frequency of trains continued to increase and in October 1987 a direct Superfreighter service to Brisbane was introduced.

"Growth of this service has been phenomenal. We now run it four days a week, each train having an 80 TEU capacity," says Adrian. "Soon we plan to increase it to six days a week.

"Basically, the service reflects client demand and extra capacity will be provided as it is needed. We expect to be running trains of 150 TEU capacity from South Dynon in about two years' time — that's double the train length we're running now."

The bigger trains will be possible when the new container terminal at South Dynon, on which work has already begun, is completed.

A look at some of the big-name users of Superfreighter gives a measure of its success. Brambles, United Transport, Mayne Nickless, FCL and K&S are regular customers, along with TNT, one of the largest road transport companies in the land.

These customers have found that Superfreighters offer an attractively priced service with guaranteed reliability. Customers can arrange door-to-door delivery of their containers by phone, in the same way passengers reserve seats.

"Instead of bottoms on seats we're putting containers into slots," Adrian Ponton says.

A computer booking system just introduced allows clients anywhere in Australia to find out where their containers are, whether they are on board a train, at the terminal or being delivered by truck.

The new South Dynon terminal will have a computer system called CHICS (Container Handling Inventory and Control System) that will provide faster information recall than the present system.

Another element in the Superfreighter success story has been the innovativeness of the individual rail systems and their ability to develop ideas jointly.

The Melbourne to Adelaide Power Service is a good example. Here refrigerated containers are run on electricity supplied from the locomotive rather than relying on the portable diesel-powered units that the customer would otherwise have to supply.

This service is an extension of Australian National's service and makes it possible to rail refrigerated containers (or reefers) all the way from Melbourne to Perth or Alice Springs.

Rail is coming to the fore in providing answers to the oldest problem in Australia: how to move large quantities of freight quickly and economically across vast distances.

Superfreighter has changed people's perception of the way the railways run in Australia. No more are they seen as antiquated, rundown and inefficient.

Superfreighters, the successful modern face of rail, run between Brisbane, Sydney, Melbourne and Adelaide, while the Westliner service runs between Adelaide and Perth.

WESTLINER SUCCESS STORY

Westliner/Superfreighter services to Kewdale (Perth) in Western Australia recently increased to five days a week.

The success of Westliner parallels that of Superfreighter and the two services complement each other.

Australian National introduced Westliner between Adelaide and Perth in April 1983, shortly after the standard-gauge line was opened into Adelaide from Port Pirie.

AN offered a fast, priority service across the Nullarbor and they soon found that customers were prepared to pay the surcharge for this service.

With Westliner, the surcharge is refunded if the train does not arrive on time.

Later in 1983, a Westliner connection was introduced between Melbourne and Adelaide.

At first, a maximum of twelve wagons were sent two days a week on general freight trains to Adelaide. On arrival, containers for Perth were transferred to the Westliner.

With the commencement of the Adelaide Superfreighter in August 1985, Westliner freight was carried on this new, faster service.

From these humble beginnings the service has continued to grow. V/Line recently added a Thursday service, so it now departs Melbourne Saturdays and every weekday except Wednesday.

THE RAIL RENEWAL

AFTER DECADES OF DECLINE, RAIL IS MAKING A DRAMATIC COMEBACK, SAYS **PERCY BARNEVIK.** HOW CAN RAIL SYSTEMS MEET THE CHALLENGE?

One hundred and fifty years since the birth of railways and 100 years since the introduction of electrified city rail systems, after several decades of stagnation and decline, we now see a renaissance in rail transport and a rebirth of railways in Europe and throughout the world.

I remember that as a student in the mid-1960s, I was amazed to see the empty "cathedrals" in the American West that were once busy railway stations. They had become monuments. The great old railway companies had either gone into bankruptcy or been turned into real estate companies. It is strange to go to the US now, 25 years later, to discuss new high-speed trains for the north-eastern corridor or in Florida and to see the building of suburban train systems in cities such as Dallas, Los Angeles and San Diego, heartlands of the automobile-user.

In Europe, the talk is of high-speed train systems, modernisation and expansion of subways and suburban networks, increased restrictions on heavy truck hauling and the growth of piggy-back traffic.

Why this dramatic change? Why this sudden revolution in transportation? There are several major reasons:

☐ Environmental concerns have exploded on us and the quality of life, in a broad sense, has become a big issue in many countries, even pushing aside issues like unemployment and fear of war. The environmental consequences of oil-based automobile and air transport are becoming increasingly visible.

☐ Congested and polluted big cities need more efficient transport and alternatives to overcrowded airports.

☐ Energy must be saved. The years of a plentiful supply of relatively cheap oil are

WE ARE SEEING A RENAISSANCE IN RAIL TRANS

numbered. Apart from environmental concerns, it is obviously a tremendous waste to run 50 heavy trucks with 50 drivers over long distances to do the job of one locomotive driver. Similarly, to fill up the roads with cars carrying only one or two passengers is energy waste. And as soon as the over-capacity of OPEC disappears, we will be in for a new rise in oil prices.

☐ New technical developments in high-speed transportation and improved cargo handling systems have made rail systems more efficient.

☐ New models for calculating transport costs that include both "hard" and "soft" costs are being used. The facts that all cars and trucks in the EC emit some 19 million tons of carbon monoxide and four tons of nitrous oxide a year can now be quantified. In the Federal Republic of Germany, these pollution costs may be 1.5 per cent of GNP. Some 54,000 deaths and 1.7 million injuries in road accidents each year in the EC can also be built into cost calculations.

Obviously, calculations like these tend to favour the railways. The speed of change has in many cases been increased by legislative measures. For example, a canton in Switzerland votes against heavy trucks and force them on to rail, or the axle weight is limited on timber trucks in Scandinavia, or Athens decides to allow only cars with odd or even end numbers into the city centre on certain days.

How should countries respond to these new challenges? I will look at the European situation, although the issues are similar in North America and elsewhere.

First, let us look at the role of governments and public authorities. They have the responsibility to provide a transportation policy as a framework and guideline for transportation. This must include rail, road, sea and air transport: all modes of transport are needed and complement each other.

They should also act to separate infrastructure from operations. Truck or bus companies do not own the roads, shipping companies the harbours or airlines the

Percy Barnevik, president and chief executive of the Asea Brown Boveri group, is an MBA graduate from the Gothenburg School of Economics and Stanford University.

IN EUROPE AND THROUGHOUT THE WORLD.

airports. There is no reason why operators or railways should own the railways or railway stations. This muddies the water and is normally to the disadvantage of the railway operators. Fortunately, changes are underway here in some countries.

There is also a need to improve the infrastructure. After decades of neglect, it is not enough to patch it up. Major surgery and investment is required. Fortunately, changes are underway. The Channel Tunnel, projected new tunnels through the Alps and major upgradings of railways in Germany and France are good examples. About 15 billion US dollars is to be spent on European railways.

When politicians in some countries say they cannot afford such investments, the reason is often that they confuse operating costs with investment costs. The latter can be written off over many years and this means raising the general competitiveness of a country through a number of indirect positive consequences. The right investments in the transportation infrastructure put a country into a positive development spiral.

In many countries, there is an uphill battle with politicians subject to vested interests who would rather take 50 small road decisions than one big railway decision.

In Europe, the road towards a borderless Europe in 1992 means a need for a coordinated transportation policy to handle the escalating flow of goods, services and people. We still have four different main gauges, five main different voltages and completely different signalling systems for railways.

I am happy to say, however, that the European Commission is now putting the finishing touches to a proposal for a directive on EC rail policy. We are confident that the document will contain valuable propositions regarding the infrastructure, the public service obligations and the European high-speed network.

The International Union of Railways – the UIC – is working hard in areas such as high-speed and overnight travel, improving productivity and quality and discussing infrastructure management.

Now for the operators role in facing up to the new challenges. Railway systems face new opportunities but also new demands. With mounting pressure for rationalisation and cost-efficiency, a service-minded, flexible and imaginative approach is essential for today's railway transportation companies. Two things are vital:

☐ Joint transport solutions between railways and road transport and between rail and air. There are already good examples in several countries.

☐ New financial solutions for example, railway companies and mass-transit companies can lease equipment, and maintenance and many other functions can be subcontracted to people who might do a better job, just as in industry.

Generally, I would say that railways must now be aggressive and competitive. They must fight for the best people and create incentives. They must apply proven organisational principles of decentralisation, cutting central bureaucratic overheads and generally streamlining operations. Many railways tie up far too much capital and poorly use real estate assets that could give a much-needed financial injection if developed or sold. The privatisation of railways is being considered in some countries and that can accelerate these developments.

After having told governments and railway/mass transit companies what they should do, a good question to ask is what the suppliers of equipment should do.

Equipment suppliers must:

☐ Continue and accelerate technical development.

☐ Increasingly provide solutions for total transport systems, either within bigger groups like ABB or in consortia with companies with fewer products.

☐ Be ready to take on bigger roles in maintenance and promote life-cycle purchase evaluations.

☐ Provide new financial solutions.

☐ Restructure and rationalise the industry to produce quality products at lower costs.

☐ Get involved in the public transportation debate and in supporting changes.

Fortunately, we see evidence of change of all areas in transport, and I think this promises a lot for dynamic development in the coming decade.

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BRISBANE'S EXPANSION

A large expansion of the greater Brisbane region's commuter rail network costing some $500 million over the next five years has been approved by the Queensland Government.

The expansion includes new electric cars, extra tracks and more inner-city rail tunnels.

"This is the most exciting and innovative development for the greater Brisbane region's train travellers since the introduction of electric trains ten years ago," then Transport Minister, Mrs Yvonne Chapman, said in announcing the program.

"Expo 88 brought the railways thousands of new patrons and boosted annual patronage on the Citytrain network to almost 50 million passengers. We must build on that success."

The expansion includes duplication of inner-city rail tunnels between Roma Street and Brunswick Street stations to reduce congestion and the provision of a fourth track between Bowen Hills and Brunswick Street to increase the capacity of the inner-city system by 60 per cent.

Facilities for Citytrain passengers at the Brisbane Transit Centre at Roma Street will be improved and new island platforms built at Central and Bowen Hills.

The Brisbane-Gold Coast railway, due to be in use by the end of 1994, will cost an estimated $240 million, including land acquisition and rollingstock, and electric trains are expected to do the 86km journey between Brisbane Central and Robina in 65 minutes at a top speed of 160km/h within five years.

Extra track capacity will be provided between Brisbane and Beenleigh, 41km south of Brisbane.

Extra platforms will be built on a number of stations along the route. New track between Beenleigh and the Robina terminus will extend for 46km and include five stations.

Additional track and improved signalling between Bowen Hills and Northgate will boost the North Coast Railway, while duplication between Manly and Lota on the south-eastern Cleveland line will also improve capacity.

Twenty-five new three-car electric multiple units will be provided – 10 units for the Gold Coast, nine for Brisbane suburban services and three on the Nambour line – to boost the present 264-car electric fleet. The first 27 new cars will enter suburban service in 1992.

Mrs Chapman said expenditure (in July 1989 dollars) over the five years would be $18 million in 1989/90, $80 million in 1990/91, $94 million in 1991/92, $116 million in 1992/93, $114 million in 1993/94 and $61 million in 1994/95 – a total of $483 million.

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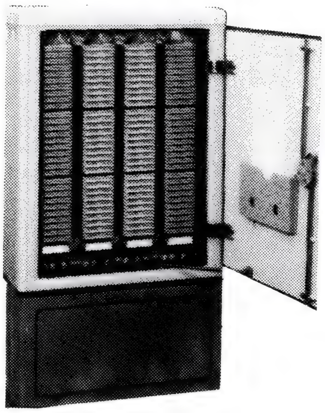

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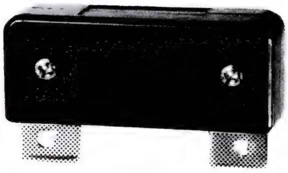

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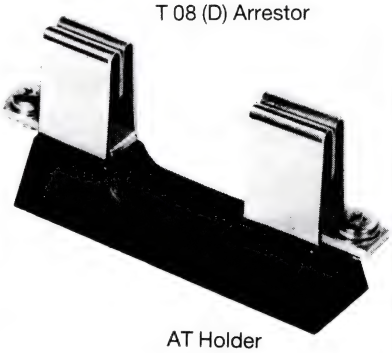

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STORE FEAST

STORE 1990 promises rail engineers and other transport specialists a kaleidoscope view of European transport systems

Australian Railway Engineers and other transport specialists will study TGV, tunnels, technology, and trams in a tour of eight European countries.

The second study tour on railway engineering (STORE) of the Institution of Engineers' National Committee on Railway Engineering leaves Sydney on October 6 1990 and returns on October 31.

In 1982, 58 railway and other transport professionals and their families spent four-and-a-half weeks as the paying guests of 11 European main-line and urban railway administrations. STORE 1990 (which replaces a planned visit to China) will be similar.

For the first time, however, the programme will include examination of urban public transport, including light rail, civil, mechanical/electrical, and signals/operation main-line railway modes. Participants will be briefed on management techniques, go on technical visits, and, of course, travel on some of the world's finest rail systems.

The tour will visit Germany, Austria, Denmark, Sweden, and Norway, and revisit the Netherlands, France, and Switzerland. There will be time for weekends in Switzerland, Amsterdam, Copenhagen, and Norway, and the group may stop over in the United Kingdom on the return trip.

Members will be given a close look at high-speed rail systems such as France's famous TGV and its German equivalent, which should be in regular traffic by the time of the tour. As well as both TGV lines and the German IC Express, they will be shown the Channel Tunnel/Northern Europe high-speed developments and the 240km/h X2 tilting train in Sweden. They will also be briefed on ABB's proposal for the Florida high-speed train, a model of which has already been shown in Australia.

The Institution of Engineers hopes this will attract non-railway people interested in VFT such as environmentalists, academics, and political decision-makers and their advisers.

Tunnels are an important part of the European high-speed routes, and there has been considerable investment in new civil engineering techniques. The tour will inspect the Channel Tunnel site, and, in the hilly country between Paris and Lyons, study the implications of the careful avoidance of tunnels by the designers of TGV Atlantique.

Tunneling continues under Paris for the RER. In Amsterdam, sunk-caisson tunnels have been constructed for the metro, and the tour will visit the modern metros in Frankfurt, Munich, Vienna, Paris, and Stockholm as well. It will cross two of the most mountainous and heavily-tunnelled railway routes in Europe, the Arlberg and Bergen lines in Austria and Norway.

Except for heavy-haul and diesel traction, the Western Europeans are probably the supreme railway technologists. Tour members will see the technology, meet the designers, and visit the ABB "technology city" at Vesteras in Sweden. There will even be diesel traction technology: three-phase ac transmissions on GM diesels (ABB) and 25 kVac electrics (Siemens, with whom GM and Clyde have aligned).

Urban transport programmes are

THE TOUR'S CLOSE LOOK AT EUROPE'S HIGH-SPEED RAIL DEVELOPMENTS SHO

being arranged in Frankfurt, Munich, Vienna, Paris, Amsterdam (and possibly another Dutch city), Copenhagen, and Stockholm.

The provisional itinerary starts in Frankfurt, where the main-line railway party meets its DB hosts and takes the express to spend two days in Munich. The urban transport groups spends these two days in Frankfurt before rejoining the mainline group. The programme is being planned with the DB and the two urban transit authorities. In the case of the main-liners it will focus on the Bundesbahn's IC Express and its implications. In Munich there will be site and factory visits, and a few hours in the famous German Transport Museum.

The whole group then travels from Munich to Vienna, the railway people via Linz, headquarters for the world-famous Plasser and Theurer track maintenance machinery. This group will spend two nights and a full day with OBB, the Austrian State Railways, while the urban transport group is the guest of the Vienna Transport Authority, which runs the largest light rail/tram network in the western world.

Both are extremely interesting systems. The provisional programme includes inspection of OBB's very-low-deck piggyback services (the so-called "rolling highway", which uses close-coupled 16-wheel wagons for transporting semi-trailers through Alpine tunnels).

The route then goes up the Danube Valley to Linz, and across the plains to Salzburg. The train next follows a mountain stream up to Innsbruck. With two powerful OBB electrics in front, the long express climbs the Inn Valley, crossing frequent westbound goods trains and the river at Landeck, and then up one of the most famous, busy and difficult-to-work trans-Alpine main lines. The Arlberg is a continuous succession of high viaducts, bowstring truss bridges, steep valley sides, and rocky spurs crowned by medieval castles and pierced by short tunnels.

The 10km Arlberg tunnel takes the express between the waters of the Inn and the Danube, flowing to the Black Sea, and the Rhine, which flows to the North Sea. Then the electrics are put on regen brake to hold the train on its long descent to Feldkirch, on the border of Liechtenstein, which takes just 15 minutes. From Buchs, the Swiss frontier post, the Swiss Federal will take the party to Zurich Hauptbahnhof, where there is a change for Lucerne.

There will be a free Saturday in Lucerne, whose Swiss Transport Museum includes a fully-working model of the famous northern ramp of the Gotthard line.

The group next travels over two of Switzerland's five famous metre-gauge cross-mountain links. The line travels from Lucerne to Alpnachstad and then climbs on the rack over the Brunig Pass, descending to Meiringen and following Lake Brienz. At Interlaken East the gauge narrows for the 900mm Bernese Oberland Railway (BOB) to climb up the Grindelwald to Kleine Scheidigg.

A standard-gauge train will take the tour up the Berne-Lotschberg-Simplon Railway's branch line to Zweisimmen for an end-on connection with the metre-gauge Montreux Oberland Railway (MOB), over the Bernese Oberland, into French-speaking Switzerland, and to an overnight stop in Geneva.

The group will join the International 3-current model of the TGV from Lausanne at Geneva. At Lyon TGV (formerly Lyon Brotteaux) the train reverses for a two-hour run up the Ligne-TGV South East to Paris. The average speed is 211 km/h, including the exit from Lyon and the suburban entry to Paris, and the maximum 280 km/h. Footplate passes have been requested from SNCF. They were granted in 1982, and if given again will be issued in order of confirmed bookings with deposits. Regrettably, not everyone can be obliged.

Technical visits in Paris, which are being arranged with SNCF and the Paris Transit Authority (RATP), will be "streamed" to cover different interests. They will include the TGV depot and the new TGV Atlantique line; signalling; suburban; RER and metro operations; and for the urban bus people, RATP operational control and maintenance practices with a strong management emphasis. A one-day side trip to inspect a low-floor train system is possible.

In northern France there will be an inspection of the Channel Tunnel project from the French side, which will include a full briefing on the high-speed European rail network being built for the 21st century. The Channel Tunnel and the Paris-Brussels-Cologne TGV are important parts of this.

The tour will visit the Somme battlefields of World War I and the Australian Memorial at Villers-Bretonneaux, where the First AIF held the German Army in the great assault on the crucial railway city of Amiens on Anzac Day, 1918. Australian railwaymen of the R.O.D. – the Railway Operating Division – worked those lines. It is hoped that the townspeople and Mayor of Amiens will attend a short memorial service in the beautiful medieval cathedral where an unknown Australian and an unknown French soldier lie buried side by side.

In Amsterdam the urban transport people will be guests of their Amsterdam counterparts, who operate a

NVALUABLE FOR EVERYONE INTERESTED IN AUSTRALIA'S VFT PROPOSAL

large light rail, metro, and bus network with a number of interesting management and commercial concepts. Main-line railwaymen will be hosted by NS, the Dutch State Railways. The emphasis will be the 1500 V ac suburban/interurban system, of compelling interest to Sydney and Melbourne electric railway people, and the handling of extensive container freight traffic.

NS is a very large "terminal complex" of railways with express container trains serving destinations throughout Western Europe. It was voted an extremely efficient operation by the STORE-1982 travellers, and all departments will be studied in detail.

The Amsterdam-Copenhagen Nord-West Express will take the tour to Denmark. Early risers will be able to study the train-ferry operation between Puttgarden, NW of Hamburg, and Rodby in Denmark. Loading and shunting the complete express takes 20 minutes, and the crossing one hour.

In Copenhagen the group will again split, the urban people being hosted by their Copenhagen colleagues and the railwaymen by the Danish State Railways (DSB). DSB is another compact, efficient rail system operating a 1550 V dc suburban system, a 25 kVac interurban line using 3-phase transmission locos with Siemens equipment, and 3300 hp diesel electrics with EMD engines and 3-phase transmissions built around BBC (now ABB) equipment.

The Danes are also experts in the application of high-quality mainline diesel-electric multiple unit sets (the Lytog trains) operating divisible services traditionally interrupted by train ferries. DSB has much to interest civil engineers, too. The Kastrup (island) airport project and associated rail links are also listed for briefings and inspections.

The trip from Copenhagen to Stockholm includes a ride on the 25 kV line, the 10km ferry crossing across the sound, and a run of 543km up the State Railway's (SJ's) most important trunk line. If the new X2 tilting train is not on this run as requested, there will be special cars of the wide and comfortable SJ variety behind one of SJ's famous Rc series electrics built by ASEA.

The urban transport and electric multiple unit people will spend time with Stockholm's Lokaltrafik, which operates the city's excellent public transport system (metro, tram, trolleybus, diesel bus), and the main-line people with SJ. Sweden is unusual in having split its railway system into an infrastructure authority (the equivalent of a highway authority) and a train operator, which is expected to pay its way.

The whole group will visit Vasteras, the company town 111 km from Stockholm that is the home of ABB, formerly ASEA. A full day's programme is being arranged to cover a wide range of advanced technical interests, including, of course, advance electric rail traction. Signal engineers will visit Ericssons.

Members of the party who wish to cut their trip short will return to Australia from Stockholm. Those who stay on will travel to Oslo for one of the world's best known train rides, the Oslo-Bergen run. The line climbs to pierce the main Norwegian range in the Gravehalsen Tunnel, 5.3 km long. The summit is only 1300m above sea-level but in late October there is likely to be heavy snow.

In Bergen, the group joins the steamer for the afternoon/overnight railing to Newcastle-on-Tyne, England. The return flight to Sydney will leave from Manchester. All internal travel will be by unrestricted first-class Eurailpass, permitting individual side-excursions for business or private sightseeing. There will be just one class of hotel, comfortable three-star.

Participants will be free to choose the visits they make, and there will be no compulsion to stay in one stream (although the rolling stock people always seem to).

The institution will publish a report on STORE-1990, as is customary with STORE visits. The STORE-1982 report's independent professional views drew extensive comment, and some of its findings have influenced technical developments on Australian systems.

STORE-1990 will, like STORE-1982, be led by Ian Macfarlane (MIE Aust Assoc IRSE FCIT) and Ross Carlton (MIE Aust MCIT). The study tour is open to any railway, railway industry, or urban transport professional - engineer, operator or administrator - from any country, and to others with a technical interest in the subject. STORE-1990 is not, however, a train enthusiast's tour. The minimum number in the party will be 20, the maximum 100; about 60 are expected. The cost should be less than $7,000.

STORE-1990 brochures and application forms are available from STORE-1990, The Conference Manager, Institution of Engineers, Australia, 11 National Circuit, Barton, ACT 2600 (tel. (061) 62 706 555, fax (061) 62 731 488). Ideas for visits to be included in the programme should be communicated to Ian Macfarlane on (061) 62 765 284 during office hours.

The closing date for applications is 31st August, 1990, but participants who wish to ensure priority and bulk-booked rates should pay the $500 deposit by 31st May.

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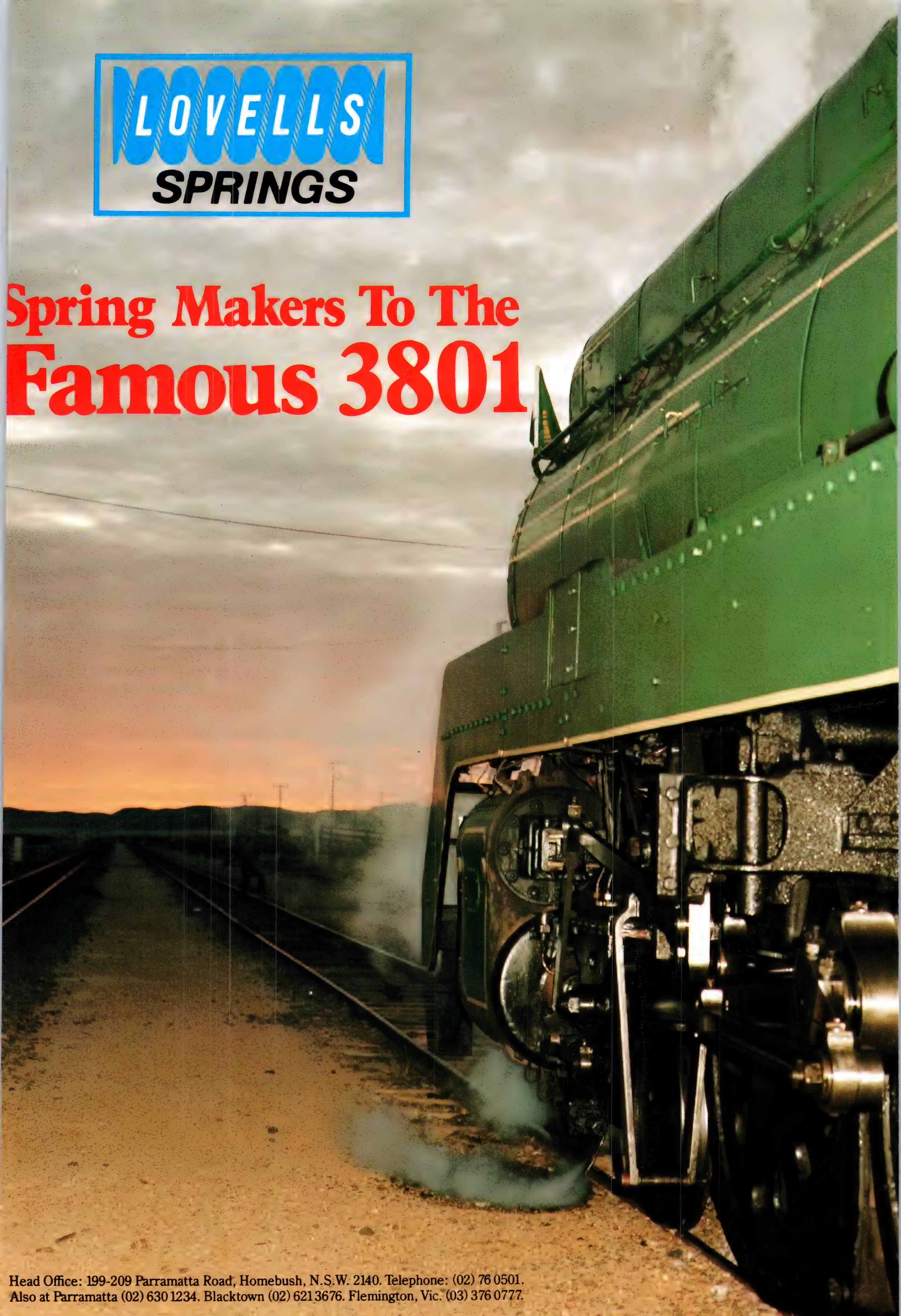

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PLAN FOR WYNYARD REVAMP

Sydney's Wynyard Park could be increased by one-third and Wynyard Station refurbished as a sophisticated bus-rail interchange under a new development proposal.

NSW Transport Minister Bruce Baird said the "Wynyard on the Park" development, proposed by Kern Corporation, had the potential to transform Wynyard Station into one of the most attractive retail facilities in the city.

Kern Corporation has freehold and leasehold property interests on the proposed development site.

Kern Corporation's proposal involves building an underground bus-rail interchange at Wynyard Station and redeveloping facilities above the station, including the site occupied by the Menzies Hotel.

"The development proposal also has the added benefit of providing more park space in the city centre," Mr Baird said.

The proposal involves re-routing buses through a system of tunnels away from York Street in the city.

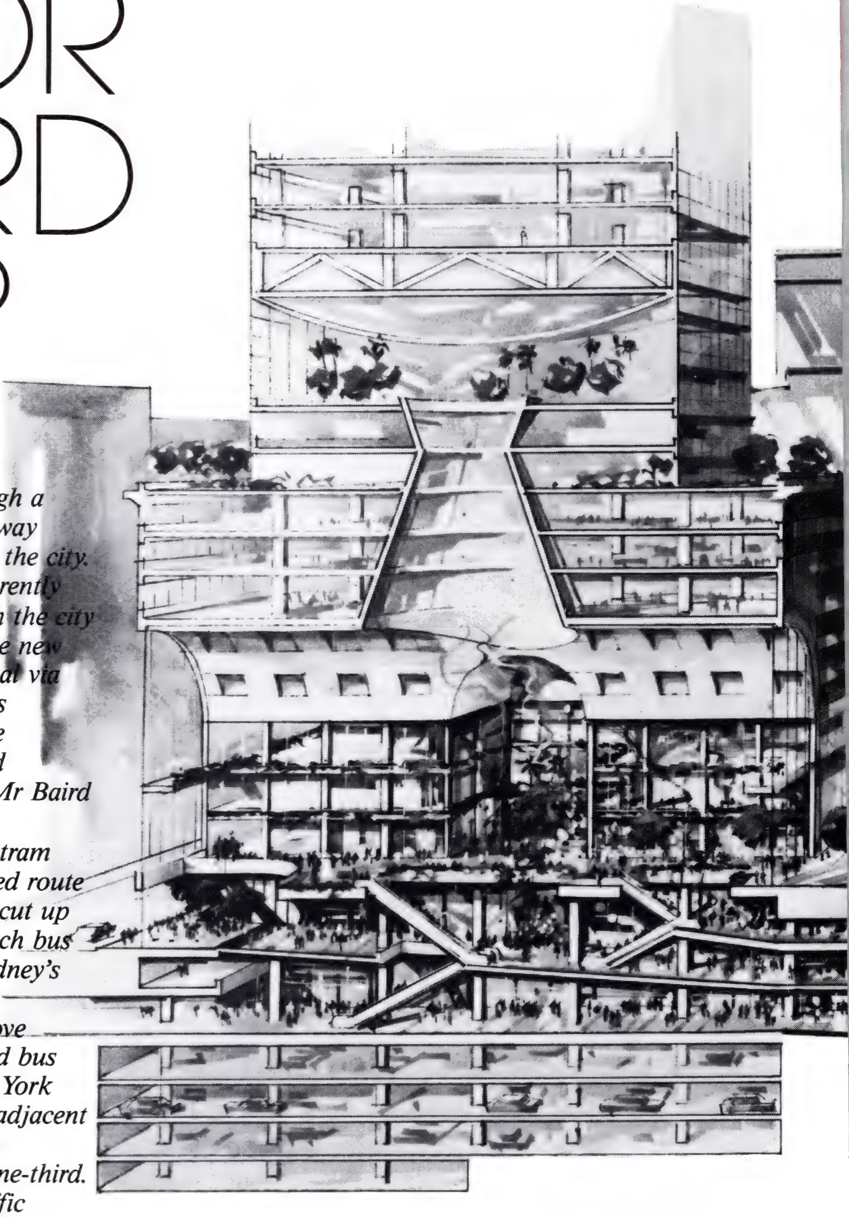
"Buses which currently choke York Street in the city would travel into the new underground terminal via disused tram tunnels running between the Harbour Bridge and Wynyard Station," Mr Baird said.

"By restoring the tram tunnels as a dedicated route for buses, we could cut up to 20 minutes off each bus trip to and from Sydney's north-side.

"This would remove heavy bus traffic and bus parking zones from York Street, allowing the adjacent Wynyard Park to be extended by up to one-third.

"The reduced traffic would mean less air pollution and noise, allowing workers and shoppers to enjoy the larger park facility."

Mr Baird suggested earlier this year that better use be made of Sydney's old tram tunnels, now used for parking.

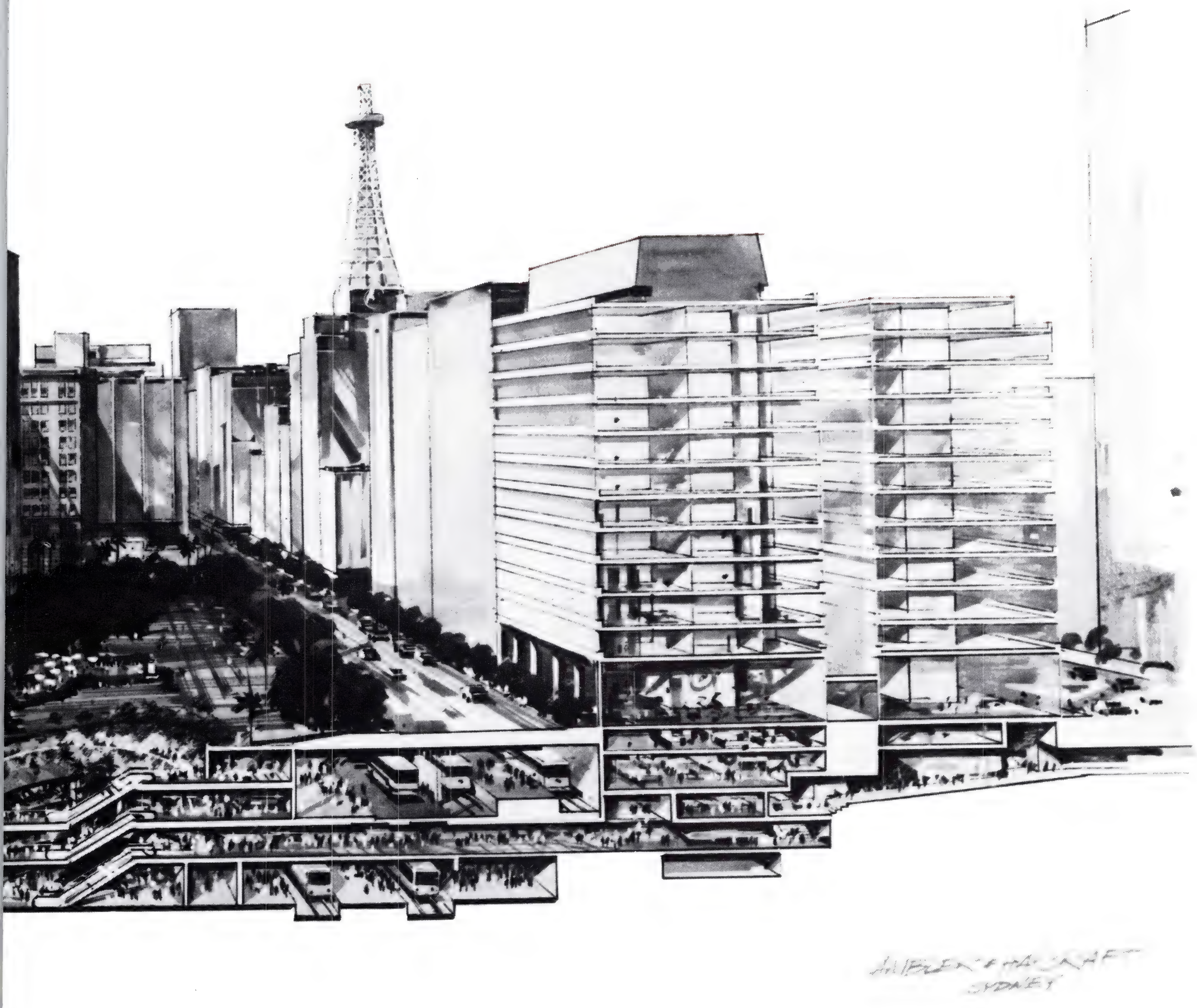


Sketch of Kern Corporation's proposal for the redevelopment of Wynyard Station in Sydney shows the enlarged park and the underground bus terminals reached by the disused tram tunnels running from the Harbour Bridge.

The feasibility of restoring the tunnels for bus use is being investigated by the State Transit Authority.

Kern Corporation's proposal for the bus-rail interchange and redevelopment of the

W SEAT



Wynyard precinct will now be evaluated by State Rail and the Sydney City Council.

Mr Baird said the State Rail Authority acknowledged that Wynyard Station would benefit from a significant upgrading.

"The proposed upgrading ties in well with the Government's decision to spend $105 million over the next five years renovating city railway stations," Mr Baird said.

"The development of a major shopping area that included a supermarket and department store would be an enormous benefit to residents and workers in the city," the Lord Mayor of Sydney, Jeremy Bingham, said.

"A food court, restaurants, taverns and a mini-cinema would help to make the interchange a busy, appealing and much-needed development in that area of the city."

WINDOW SEAT

V/LINE LEADS WITH FIRST LONG COACH

Australia's first long coach, running between Warrnambool and Mt Gambier, is making V/Line an industry leader in 1990.

The five-star coach is 14.5m long, seats up to 64 passengers, and costs less to buy and run than an articulated coach and a good deal less than its cousin, the double-decker.

Matt Jowett, Coach Services Development Manager, says V/Line has been operating double-decker coaches on several routes since 1987, but some passengers have problems with them.

"They operate reasonably well, but some passengers have difficulty negotiating the stairs and feel insecure because of their isolation from the driver.

"We introduced them for the high-demand routes where a conventional coach couldn't cope with the number of passengers, and where we didn't have the need for an extra coach.

"The long coach, on the other hand, is a stretched version of the five-star coach, with 45 per cent more capacity."

Matt Jowett says the long coach is much safer and more economical than articulated coaches or double-deckers.

"Once again, our services are growing to the point where we need extra capacity, so we decided to look at the new breed of coaches."

Longer vehicles like this are popular in Europe, and two are used by Hammersley Iron in Western Australia to carry employees to and from work sites in the Pilbara. These coaches seat up to 20 more people than the standard size and only three less than most 18m articulated coaches.

Scania and Volvo introduced long coaches to Australia. In Victoria permission was required from the Roads Corporation because the

Not just by a nose: our most fuel-

Actual on-the-track fuel-efficiency tests were recently conducted on a major U.S. railroad, using the GM SD60 equivalent of a Clyde Super Series Locomotive. It was pitted against their major competitor.

Unlike some earlier fuel-efficiency tests, these were conducted in the real world, on hills and curves and with starting, stopping and under simulated load conditions.

A lot of people expected the Super Series to come in second. After all, General Motors didn't become the world's number one maker of locomotives because of fuel-efficiency alone.

They became number one because their locomotives are reliable, tough and easy to maintain. And because of the speedy reliability of parts and service.

Well, guess what happened.

The Super Series won the test. Not by much, but it did win.

Why? Because a smooth running locomotive doesn't burn as much fuel. And because the Super

coaches are outside permitted coach dimensions.

Matt Jowett says some changes had to be made to the Warrnambool-Mt Gambier route because the length of the coach meant difficulties on some bends and corners.

"The Roads Corporation people made some minor modifications to the design of the vehicle. They ordered the tapering of its sides so the end wouldn't swing out as much on corners, and they changed the weight distribution on the rear axles."

The future of the 14.5 metre coach, to be operated by South Western Roadways, hinges on its performance. But Matt Jowett is confident that it will be a winner.

"One of these coaches was taken for a trial run around Melbourne's streets last January, and its manoeuvrability was astonishingly good. Naturally, though, it couldn't handle corners in narrow streets."

Saab-Scania Australia of Campbellfield supplied the chassis, and Volgren Australia of Dandenong completed the coach.

Terry Mulligan, V/Line Chief General Manager, points out features of the new dot matrix passenger information displays at Melbourne's Spencer Street Station to the Minister for Transport, Jim Kennan, and Spencer Street Terminal Manager Lawrence Norton.

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WINDOW SEAT

CITYRAIL COMES CLEAN

State Rail of NSW is putting $7 million into CityRail's cleaning services to give Sydney a fleet to match any in the world for cleanliness.

The new program includes capital investment in improving security at maintenance depots, new facilities and equipment, and streamlined cleaning schedules.

Marked improvements have already been made to the fleet's general appearance by a series of initiatives begun in 1989. The result has been a big reduction in customer complaints about train cleanliness, and a rise in favorable comments from the public.

Train cleanliness has always been high on the list of committee concerns in railway surveys. But until the new initiatives cleaners fought a losing battle with vandals, graffiti daubers and passengers who use trains as mobile rubbish dumps.

The behaviour of these people has not improved. The big change has been in CityRail's determination to beat the problem.

Damon Schreiber, CityRail's Train Presentation Manager, has been given the job of making the program a success. More than 600 depot cleaning staff are contributing to the fleet's clean new look, by cleaning carriages at new levels of speed and thoroughness.

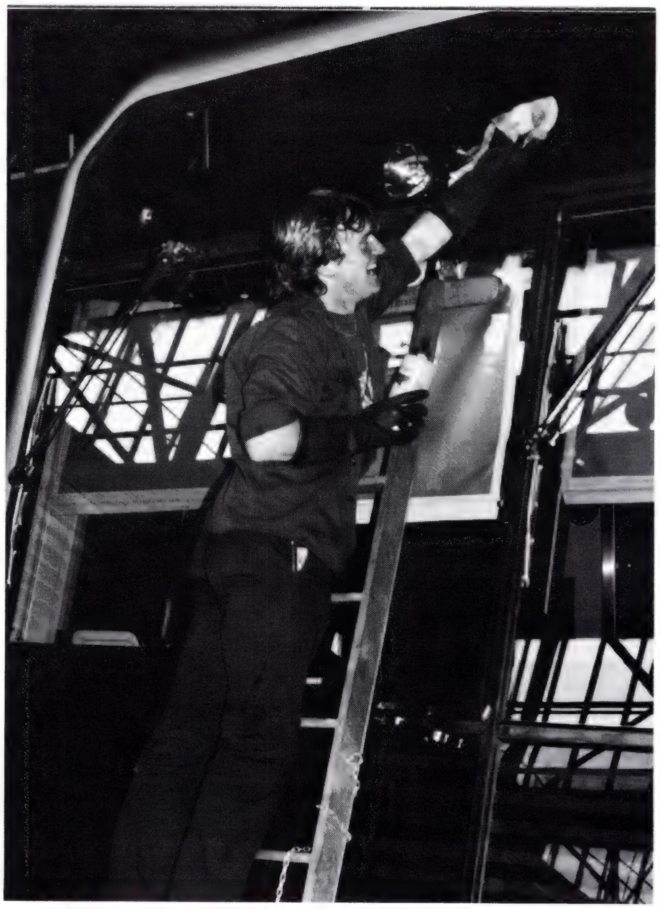
A program in which every car was springcleaned to a high standard was the first step. Now monitors ride the trains day and night to maintain the standard and identify cars for further thorough cleaning and removal of graffiti.

Where once trains were cleaned on a haphazard schedule, now all cars are on computer program that keeps track of their cleaning history and ensures they are checked regularly.

At the four main maintenance centres cars are now washed every seven days. Every carriage in the fleet is cleaned daily, and spot-cleaned every 30 days, a period that will soon be reduced to 14 days.

As well, a new team of uniformed cleaners armed with feather dusters, garbage bags and lemon-scented disinfectant sprays boards trains between 9am and 2.30pm to clean littered carriages. Wearing bright navy overalls with CityRail logo on the back, the six-member team travels on all lines.

Apart from earning public gratitude for cleaner trains, they have also been able to restore lost goods ranging from wallets to a microwave oven to grateful owners.



Vital part of the big clean-up: A worker at a Sydney CityRail depot puts an extra shine on to an already gleaming Tangara. All CityRail cars are now washed every seven days and their cleaning recorded on computer.

New steps to cleanliness include:

☐ The standardisation of cleaning agents and equipment.

☐ Improved exterior washing agents.

☐ Redeployment of painters to depots to help remove graffiti. It has been found to be more effective to paint out graffiti on the outside of red sets. Graffiti on these sets is now at an all-time low.

☐ Stronger graffiti removal chemicals are now being used.

☐ Faster identification of dirty carriages for immediate cleaning through a monitoring system that concentrates on quality rather than quantity.

☐ Stringent controls to ensure washplants operate effectively.

"All these measures have been highly effective," Damon Scheiber says. "But we are seeking to achieve continually higher standards.

"Presentation supervisors will soon be appointed at the four major maintenance depots to assist cleaning staff in improving staff performance and commitment.

"We also want to make sure the public is aware of our efforts, and will seek public support to help maintain the cleanliness of our fleet."

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WINDOW SEAT

PTC's SAFETY FIRST

Victoria's Public Transport Corporation has become the first public sector organisation to win a WorkCare Prevention Award.

Neil Pope, Minister for Labour, said the PTC recognised the importance of safe manual handling and had made a significant reduction in WorkCare claims.

The V/Line Occupational Health and Safety Training Section set up a pilot training scheme at Bendigo Workshops in February 1989, and this has been extended to other workplaces and track maintenance gangs across Victoria. The program will soon cover The Met operations as well.

"The training has involved co-operation between management, unions and workers," said Mr Pope.

"It has encouraged workers to identify work practices in their own workplace which need to be recognised as health and safety problems — and then solve the problem. As a result more than 50 solutions to health and safety problems have been developed since February."

Here Colin West, Acting General Manager Organisation Development, Public Transport Corporation (left) shows Neil Pope, Minister for Labour, one of the award-winning V/Line manual handling designs.

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At the combined opening of new premises in Adelaide's CBD and the announcement of Teknis International Railroad System's Thailand signals contract were (from left) Mr John Fisher, managing director of Swedish Machine Tool's South Australian division, Mr Peter Crawford, director-designate of the South Australian Department of State Development and Technology, and the South Australian Minister of State Development and Technology, Mr Lynn Arnold.

TEKNIS THAI CONTRACT

An Australian company, Teknis International Railroad Systems (TIRS), has beaten international competition to win a contract for the supply of railway signalling and telecommunications equipment to Thailand.

The contract, valued at nearly $1 million and announced in Adelaide by South Australia's Minister of State Development and Technology, Mr Lynn Arnold, is the first overseas success for TIRS.

Mr Arnold announced the contract while opening new administration and engineering premises for TIRS and one of its shareholders, Teknis Systems, in Adelaide's CBD.

"We believe the TIRS systems will demonstrate that it is lower in capital cost, more simple to operate, has lower maintenance and is more cost-effective than previously used railway systems," Mr Arnold said.

Mr Ron Davison, general manager of TIRS, said the Thailand contract was for the installation of the TIRS signalling and telecommunications equipment along a 31km section of the Maeklong line between Bangkok and Mahachai.

"It gives TIRS the inside running in competition for much larger South-East Asian contracts and, combined with our Australian successes, has already precipitated inquiries from Malaysian railway authorities," he said.

Design and installation would take a year, and Asian authorities would assess the demonstration project over the following 15 months.

Mr Julian Smith, manager of Teknis Systems, said the Thailand system was based on a version produced by the group for use on long-haul rail systems in Australia.

These included train control systems supplied to Australian National for use on more than 1800km track across the Nullarbor Plain and Central Australia.

Mr Smith said the TIRS system sold into Thailand had been modified to suit local conditions and would be monitored against a system operated by the State Railway of Thailand.

The Australian-developed system transfers all signals from the track to inside the locomotive, using radio links and computers to transfer movement and control information to and from a control centre.

Westrail has appointed Chief Mechanical Engineer John Sutton as its first General Manager, Business Development.

Announcing the appointment, Commissioner of Railways Jim Gill said Mr Sutton's new position reflected Westrail's focus on business performance in both quality and productivity.

In a separate move, Westrail's Directors will become General Managers. Mr Martin Baggot will be the General Manager, Rail Operations, and Mr Dick Collister will be General Manager, Finance.

Mr Ross Drabble, previously Director of Marketing, will be Chief Manager, Marketing.

Mr Brian Cornish will temporarily act as Chief Mechanical Engineer until the appointment of a General Manager, Engineering.

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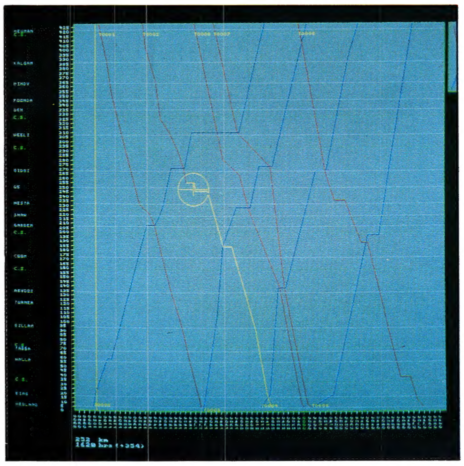

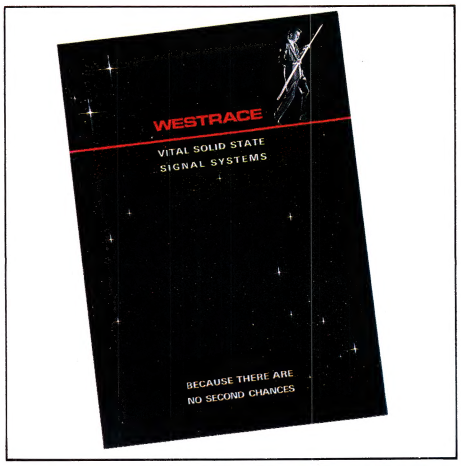
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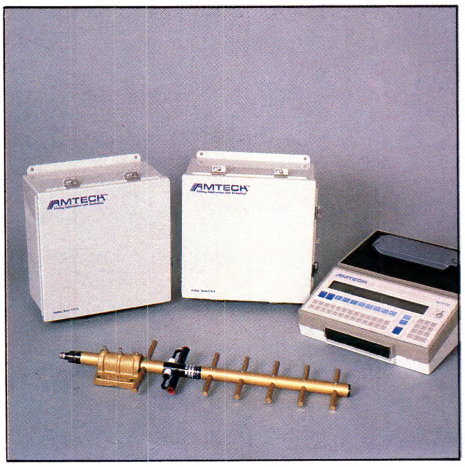

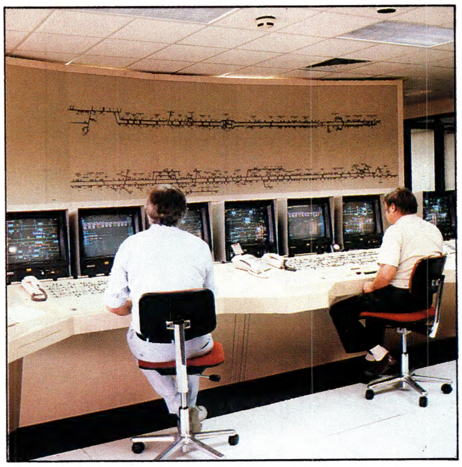

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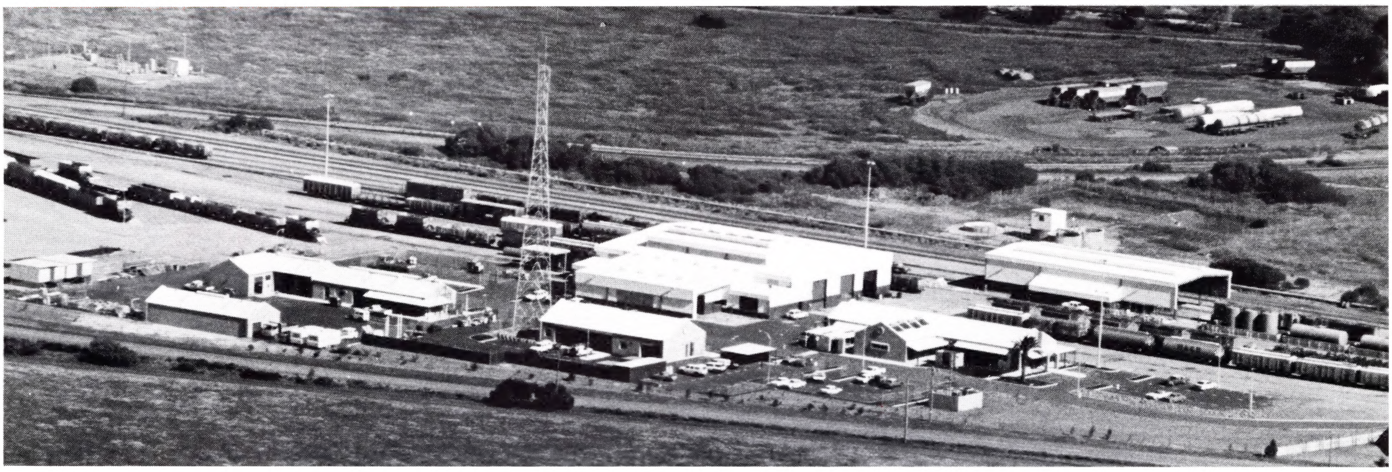
WINDOW SEAT

NEW RAIL CENTRE



The new regional rail centre in the Geraldton suburb of Narngulu, built at a cost of $9.1 million as the headquarters for all Westrail operations and maintenance activities in the mid-west, has been opened by the Premier of West Australia, Peter Dowding.

Its completion paves the way for the redevelopment of the former railway yards on the Geraldton foreshore.

Mr Dowding said Westrail's relocation to Narngulu would have great benefits for the people of Geraldton, allowing the development of a hotel, marina, small boat harbour, parks and housing.

It had also given Westrail the opportunity to build new facilities that would lead to better service to rail customers.

"Westrail is enjoying a boom in the mid-west because of growth in agricultural and mining exports. The regional operations centre in Narngulu has been designed to allow Westrail to respond to this boom with maximum efficiency," Mr Dowding said.

"The new centre is also in keeping with my Government's aim of opening up waterfront railway land for tourism, commerce and recreation. This has already happened successfully in Bunbury and is soon to begin in Albany."

The Westrail centre has locomotive, wagon and road vehicle servicing facilities, civil engineering and signalling workshops, and an area manager's office. It is close to the Narngulu industrial area where Westrail rails coal, mineral sands and synthetic rutile.

BR's CLASS 91 IN SERVICE

Britain's new high-speed electric train which has clocked 260km/h in tests, is now in service between London and Leeds, covering the 304km journey in one hour 59 minutes.

Introduction of the chisel-shaped InterCity 225 marks a major step towards completion of British Rail's biggest project — the electrification of the line between London and Edinburgh, one of its most important routes.

Initially, the new trains will be of eight passenger coaches, increasing to nine. Entrance doors are power-operated and the vestibules are heated and trimmed to provide a warm welcome. Connections between coaches are fully sealed to reduce noise and draughts.

Passengers can have either tables or seat-back tables and smoked-glass partitions break up the coach interiors. Extra fold-down seats are provided in the vestibule areas and a telephone booth for national and international outgoing calls is next to the dining car. One coach is equipped for the disabled.

Hauling the train is Britain's newest and most powerful Class 91 electric locomotive, powered by four direct current traction motors.

Thirty-one of the Class 91 locomotives will go into service on the £400 million electrified eastern network in the next two years. However, they will not replace all the successful 125 diesels, some of which will be retained on BR's rural and short-distance services.

The Class 91, built by GEC and the coaches by Metro-Cammell. Slight modifications have had to be made to the track, and many of the features of BR's advanced passenger train (APT) have been incorporated in the new locomotive. (The APT achieved 262km/h in trials in 1979 but, because of problems with tilt, did not go into production.)

The Class 91 locomotive, which is equipped with a cruise control system, has a Driving Van Trailer (DVT) at the back of the carriages. When this is leading the train, the driver controls the locomotive by computer. An onboard microprocessor monitors performance, giving a daily log of any maintenance problems. Most train announcements are broadcast automatically from more than 60 digitally-recorded messages.

Despite the locomotive's 4698 kW, it produces low track forces, which means less wear and tear on the track and a smoother ride for passengers. The low track forces are achieved by mounting the direct current electric motors on the body rather than on the bogie, each providing 30 per cent more power than similar engines.

Each motor drives on axle through a right-angle gearbox, the axle passing through the middle of the box. Power is transmitted to the wheel by flexible drive, allowing the axle to move up and down on its suspension.

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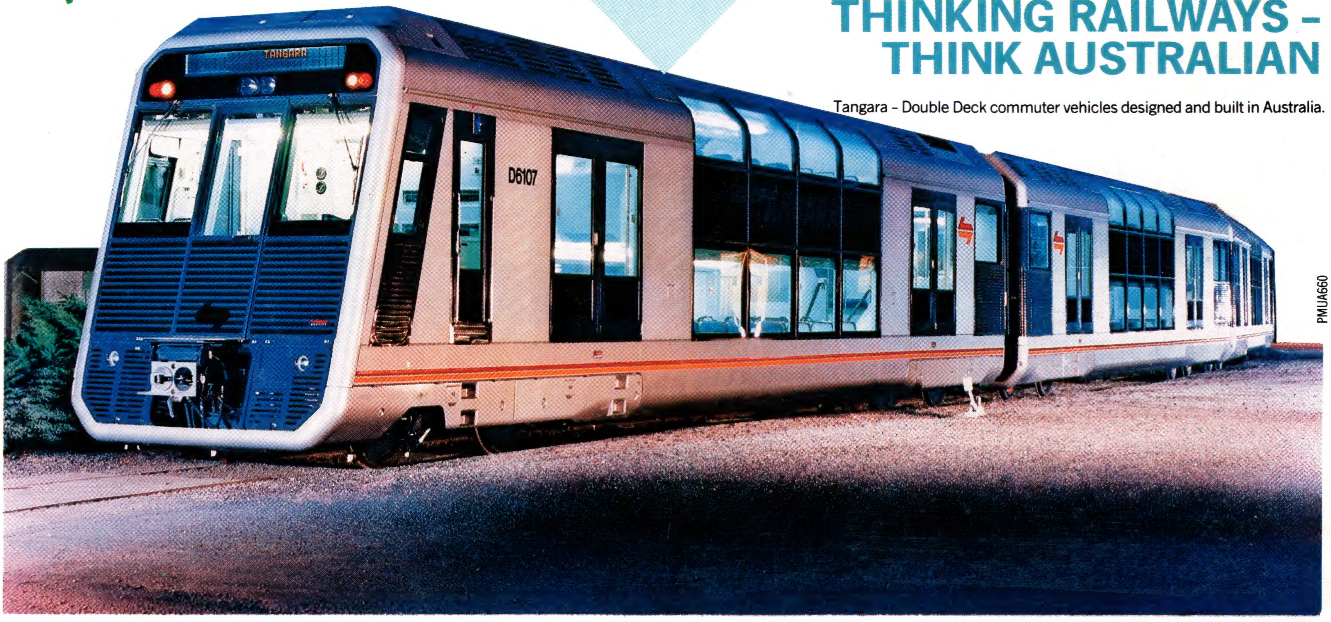

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